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User Guide for MINTACS SeeTrack Exchange (MINSTE)

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DSTO-TN-0887

ABSTRACT

The computer program MINTACS SeeTrack Exchange (MINSTE) interface was developed to support the automated data transfer to the RAN Mine Warfare Tactical Decision Aid MINTACS from SeeTrack, a post-mission analysis tool for data collected by towed or self-propelled (unmanned) side-scan sonar systems in support of military operations such as reconnaissance of sea routes for detection of mine-like objects. This document is a detailed technical user manual for the MINSTE software program. For a general overview of MINSTE design principles and objectives, the reader is referred to DSTO-GD-0574, "Design and Evaluation of the MINTACS SeeTrack Exchange (MINSTE) Concept Demonstrator.

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User Guide for MINTACS SeeTrack Exchange (MINSTE)

Executive Summary

The Royal Australian Navy (RAN) currently uses the Mine Warfare Tactical Command Software (MINTACS) Release 12 for Mine Countermeasures (MCM) mission planning and assessment. Recent MCM exercises are investigating the deployment of underwater unmanned vehicles (UUV) for route surveys. The route survey process has a post-processing stage in which the unmanned system's side scan sonar records are reviewed for contacts of interest. SeeTrack is one software application currently used for this post-processing stage. SeeTrack is a 'generic' UUV mission planning and battle space visualisation tool that acts as a viewer and software analysis tool for side scan sonar imagery. Mine-like contacts detected during post-mission analysis conducted with SeeTrack or similar applications can be imported into MINTACS for force-level mission assessments and battle-space visualisation. However, the current release of MINTACS only allows manual entry of contact data by the operator, much of which must first be converted into compatible dimensional units, chart datum and date/time formats. This tedious, time-consuming process is prone to error, and can ultimately prove unworkable in light of current concepts of operation for unmanned systems, which dictate the reporting of all suspicious contacts; in previous exercises, these reports are known to be in the hundreds. Clearly, in this circumstance, operator overheads can be substantially reduced by automating some aspects of contact reporting.

The software program MINTACS SeeTrack Exchange (MINSTE) was developed as a concept demonstrator to test and evaluate requirements for automation of data exchange between MCM mission planners.

MINSTE is designed to transfer contact data from SeeTrack to MINTACS in a sequence of three steps:

- Step 1: Selected mission and associated contact data from the SeeTrack database is converted to an XML document.
- Step 2: Contact data from the XML document is then imported into the MINTACS Route Survey Database (RSDB) and displayed as an Unclassified Sonar Contact (USC[1]) type in the MINTACS Operational Area Manager.

[1] USC classification is assigned as contact type so to align with MINTACS R13 Additional Military Layer (AML) import procedure. MINTACS R13 imports AML Small Bottom Object products and assigns these contacts with USC contact classification.

- Step 3: Contacts stored in the RSDB may be promoted to actual or suspected mines – features that are stored as mine objects in the MINTACS Tactical Display Manager. MINTACS Release 12 requires tactical features to be entered manually. MINSTE automates transfer between the RSDB and tactical database, and provides data filtering functionality to assist with proper selection of contacts.

This report is the operator's guide for MINSTE. It is intended that the MINSTE application and this guide should be used together. The guide provides detailed descriptions of all the features of MINSTE, including description of how the data is used within MINTACS once it has been imported.

An accompanying CDROM is attached to end of this report containing the described software and DSTO-GD-0574: Design and Evaluation of the MINTACS SeeTrack Exchange (MINSTE) Concept Demonstrator.

Contents

Acronyms

AML	Additional Military Layer
DSN	Defence Secret Network
ESRI	Environmental Systems Research Institute
GUI	Graphical User Interface
HTML	Hyper-Text Mark-up Language
JAR	Java ARchive
JAXB	Java Architecture for XML Binding
JRE	Java Runtime Environment
MCD	Mine warfare Clearance Diving
MHC	Mine Hunter Coastal
MINSTE	MINtacs SeeTrack Exchange
MINTACS	MINe warfare TAtical Command Software
MS	MicroSoft
MWCSS	Mine Warfare Command Support System
PMA	Post-Mission Analysis
RAN	Royal Australian Navy
RSDB	Route Survey DataBase
SQL	Structured Query Language
TDS	Tactical Data System
USC	Unclassified Sonar Contact
UUV	Unmanned Underwater Vehicle
XML	eXtensible Mark-up Language

1. Introduction

The MINTACS SeeTrack Exchange (MINSTE) assists in the automatic transfer of contact data between software used for post mission analysis (PMA) of side scan imagery and the tactical decision aid MINTACS. This release of MINSTE supports data transfer between SeeByte's SeeTrack software and MINTACS only.

The data transfer is conducted in two steps. The software exports a selected mission and its contacts from the SeeTrack database and saves this data to an XML file. This XML file can then be imported into the MINTACS Route Survey Database (RSDB) and so appear as a contact feature in the MINTACS Operational Area Manager.

In addition, the MINSTE tool also supports the selection of a contact from the MINTACS RSDB and its promotion to a mine object in the MINTACS Tactical Display (and therefore, importation into the MINTACS database).

Developer notes for the MINSTE application are attached as Appendix B.

2. Context

2.1 MINTACS

MINSTE is compatible with Release 12 of the **Mine Warfare Tactical Command Software (MINTACS)**[2]**,** developed under Project SEA 1297 – The Mine Warfare Command Support System (MWCSS) for Mine Countermeasures mission planning and assessment. MINTACS Release 12 is currently in use by the Royal Australian Navy (RAN). The next release of MINTACS will provide some support for the automatic transfer of contact data by the importation of Additional Military Layer (AML)[3] files. It is anticipated that MINTACS Release 13 will be rolled out on the Defence Secret Network (DSN) during the first quarter of 2009.

2.2 SeeTrack Military

SeeTrack[4] is a "generic" Unmanned Underwater Vehicle (UUV) mission planning and battle space visualisation tool. It acts as a viewer and analysis software for side scan sonar imagery (*.mst, *jsf and *.xtf files) and allows data to be exported in HTML, AML and ESRI shapefiles.

2.3 XML

The **Extensible Markup Language** (**XML**)[5] is a general-purpose *specification* for creating a custom markup language. It is classified as an extensible language because it allows users to define their own elements. Its primary purpose is to facilitate the sharing of structured data across different information systems. It is a fee-free open standard.

[2] MINTACS brochure can be downloaded from URL - http://www.sfs.com.au/mintacs.html
[3] AML products have been developed by the UK Hydrographic Office as a unified range of digital geospatial data sets to be used as layers on top of charts. Further information can be obtained from URL - http://www.ukho.gov.uk/add/services.asp.
[4] SeeTrack brochure can be downloaded from URL - http://www.seebyte.com/Military/
[5] XML standard can be downloaded from URL - http://www.w3.org/XML/

3. MINSTE Overview

3.1 MINSTE Concept

The MINSTE application is a means of moving data from the SeeTrack database to and between the MINTACS databases. MINSTE only communicates with the SeeTrack application database and / or the MINTACS application databases.

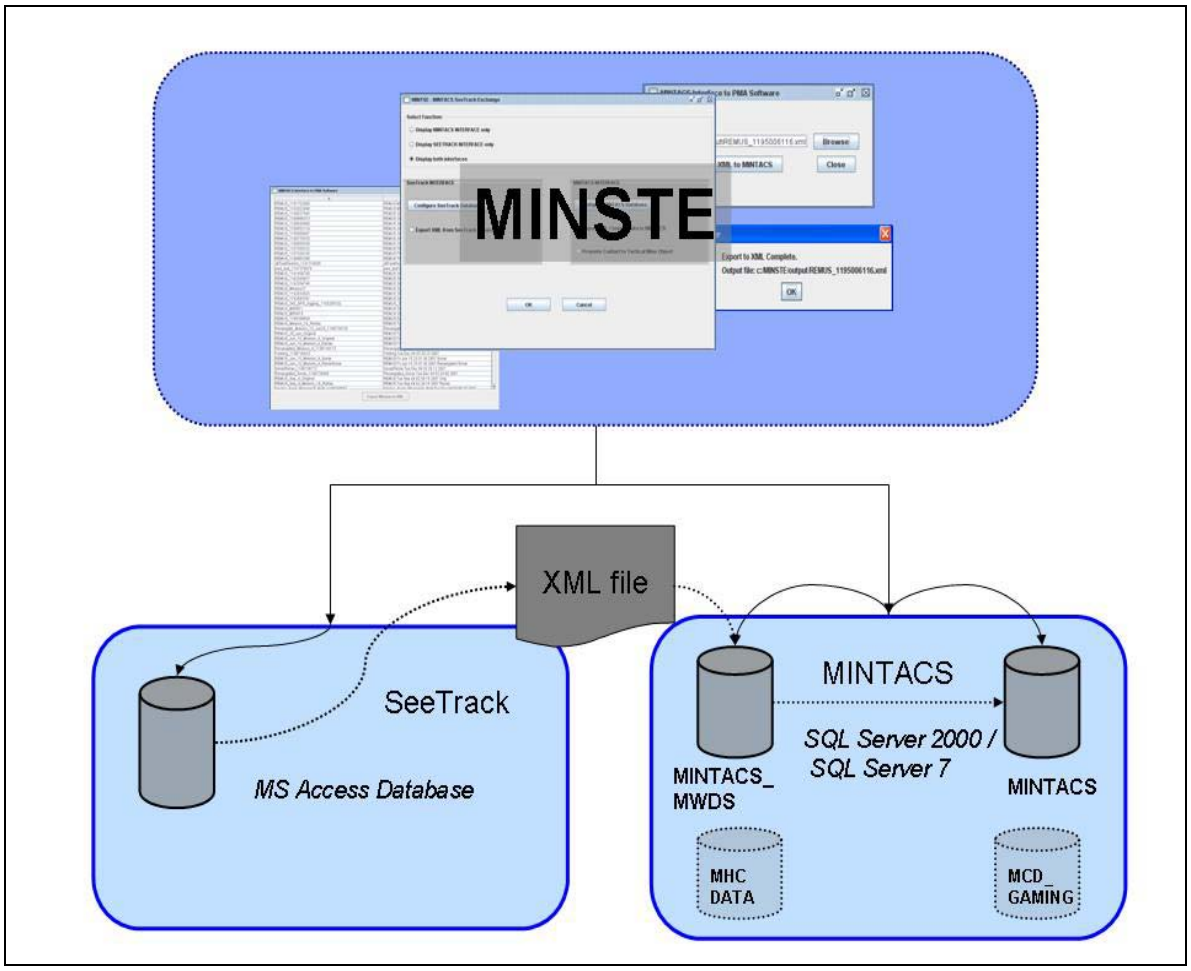


Figure 1: A high-level view of the MINSTE application and the databases with which it communicates

3.2 Functionality

MINSTE Release 1 provides functionality to:

1. Export contact data from the SeeTrack database to a XML file.
2. Import the XML file into the MINTACS Route Survey Database.
3. Promote a contact in MINTACS to a tactical mine object.

Figures 2 and 3 detail how MINSTE interacts with the databases to provide its current functionality.

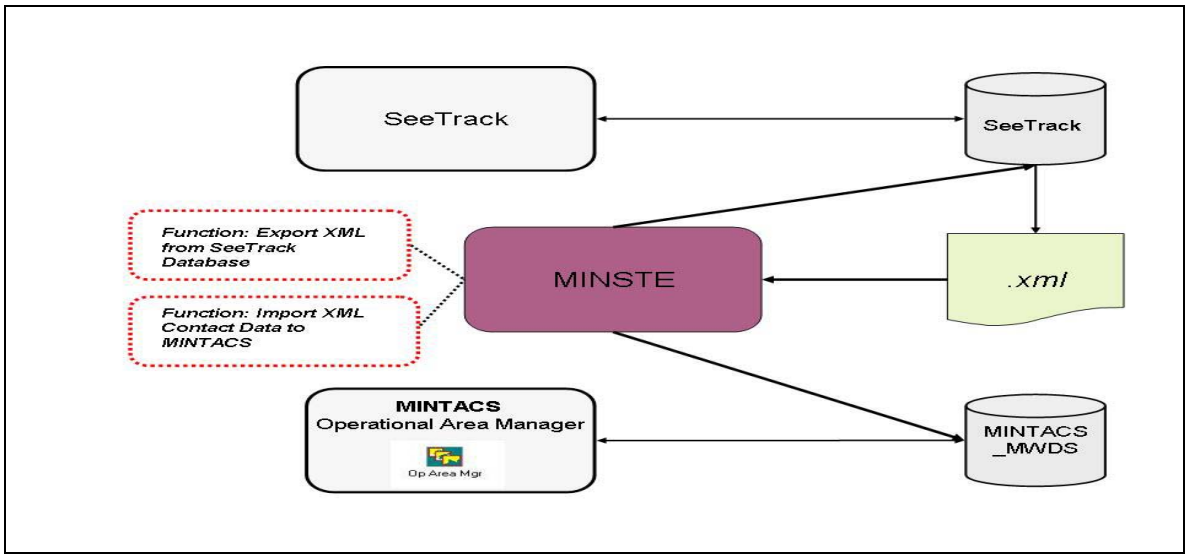


Figure 2: Diagram detailing MINSTE functionality. MINSTE communicates with the SeeTrack database to export Mission and Contact data to an XML file. MINSTE reads the XML file and creates the appropriate data format to then import into the MINTACS Route Survey Database (RSDB), named MINTACS_MWDS. The contact data imported into MINTACS_MWDS will then be displayed in the MINTACS Operation Area Manager.

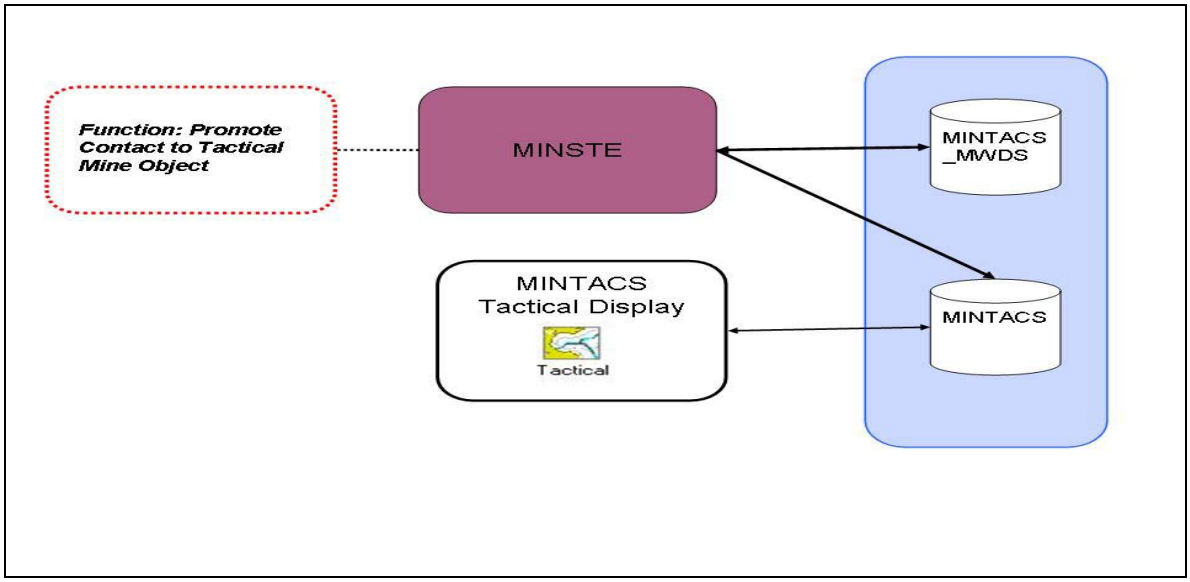


Figure 3: Diagram detailing MINSTE functionality. MINSTE communicates with the MINTACS RSDB, named MINTACS_MWDS, to retrieve contact data to display to the user. The user is then able to select the contact to promote to be a Tactical Mine Object. MINSTE will format contact data into the correct data format to be imported into the MINTACS database, and be displayed as a mine object in the MINTACS Tactical Display.

3.3 Graphical User Interface (GUI)

MINSTE was designed with a simple Graphical User Interface (GUI) with each function and database configuration available from a main window. The GUI provides self-explanatory directions and requirements. This is achieved by controlling user input or selection by enabling/disabling functionality as the user proceeds with its use. Each function is managed through a series of windows displayed to the user as they proceed through the selected task.

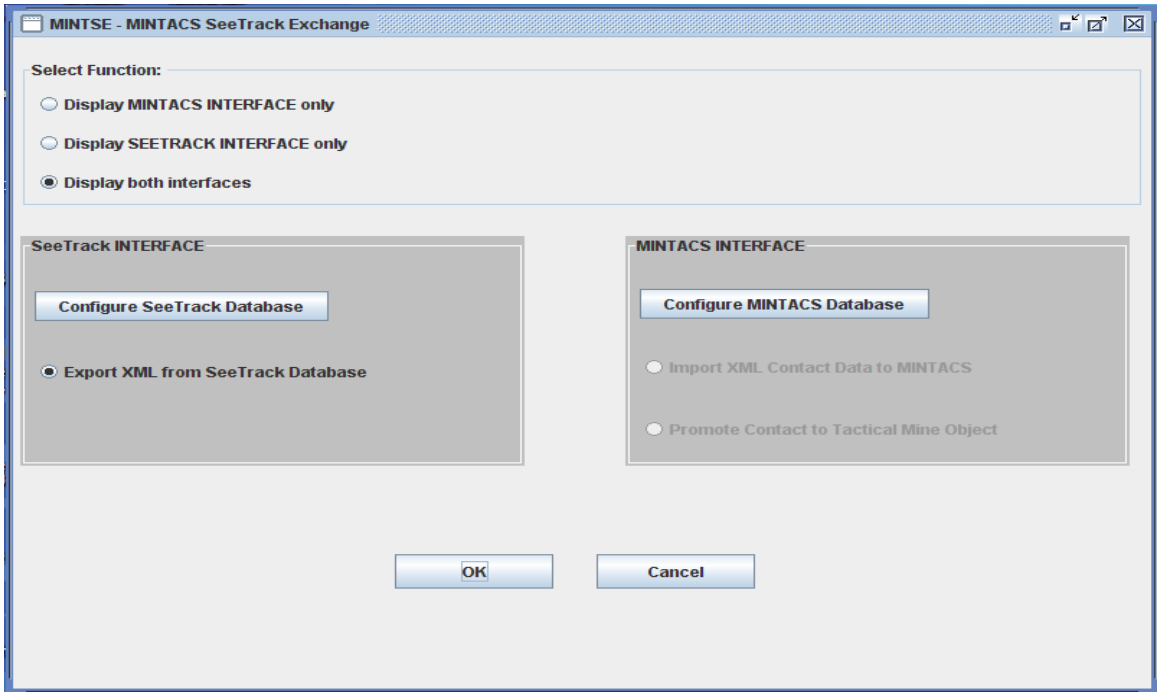


Figure 4: The main window of the MINSTE application. This window controls access to the program's functionality. Each function is only enabled when the database configuration has been established correctly. To set-up the database configuration the user selects the 'Configure SeeTrack Database' or 'Configure MINTACS Database' button (refer to Section 6.6: Configure Database Connection). In this window only the SeeTrack database has been configured, thus enabling the SeeTrack Interface function.

Once the databases are configured correctly the functionality will be enabled.

3.4 Data

3.4.1 MINTACS Databases

MINTACS uses Microsoft (MS) SQL Server 2000 / MS SQL Server 7 to store its persistent data.

The SQL Server used by MINTACS contains four databases for its persistent data[7]:

- MINTACS: - primary database and stores the elements relating to the main functions of the MINTACS Tactical Display Manager.
- MINTACS_MWDS: - is the information repository for all route survey related data and supports capabilities within the MINTACS Operation Area Manager.
- MCD_GAMING:- contains the information about the games generated by the Mine Warfare and Clearance Diving (MCD) Gaming components of MINTACS.
- MHCDATA: - the Mine Hunter Coastal (MHC) Data database contains the raw information coming from the Australian Huon-class Tactical Data System (TDS)[6].

The MINTACS databases are separated into four databases for the following reasons:[7]

- A separate MINTACS_RSDB provides the capability to install a potentially large database of environment and contact data on a separate database disk and / or server. As well, it provides the ability to build a separate environmental data management application without the need for the associated MINTACS operational capability.
- A separate MHCDATA database allows for configuration capability and maintenance of a potentially large database.
- A separate MCD_GAMING database was a user requirement to enable the building of other applications using the gaming capability without the need for a full installation of MINTACS databases.

MINSTE uses only the MINTACS and MINTACS_MWDS databases.

3.4.2 SeeTrack Database

SeeTrack uses a Microsoft Access database to store its persistent data.

[6] The TDS name is NAUTIS.
[7] Mine Warfare Tactical Command Software Release 12 Database Design Description, SfS-004-010.

3.4.3 XML Schema

The XML schema used for this version of MINSTE is provided as Appendix A. The schema elements are in the following format:

- Mission
    - Mission Name (string)
    - Mission Description (string)
        - Contact (object list)
            - Contact Id (integer)
            - Latitude (double)
            - Longitude (double)
            - Width (double)
            - Length (double)
            - Height (double)
            - Data/Time Find Time (date/time)

3.4.4 Properties File

Database settings are stored in a properties file (MINSTE.properties). This properties file is stored in the same directory as the MINSTE application (MINSTE.jar). Program run-time errors will occur if the properties file location and content are changed.

3.4.5 Hard-coded Data

The following data is currently hard-coded into the source code. Future release of MINSTE will allow for the values to be entered by the user.

Contact Label: - the label format for a contact that is imported into MINTACS is:
Unique generated sequence number_SeeTrack Contact Id_SeeTrack Mission Name

Mine Reference Number: - when promoting a contact to a mine object the user defined reference number is appended with the selected asset call sign.

Error Ellipse: - the default values of the error ellipse assigned to each contact when imported into MINTACS are as follows:

- Bearing = 350
- Major Axis = 10
- Minor Axis = 10

Contact Classification: - the default value of the contact classification is Unclassified Sonar Contact (USC).

Once the data has been imported into the MINTACS databases some values for the hard-coded data may be changed within the MINTACS application. All the contacts are displayed by the Operational Area Manager: Manage Environmental Data functionality (accessed by

MWDCM -> Manage Environmental Data). Each contact's property can be accessed by selecting the contact and clicking Modify.

The following contact data can be changed:

- Contact Classification: - this value can be modified in MINTACS through the Contact Feature Properties dialog box and selecting contact classification from the values available in the drop-down box.

- Error Ellipse: - select the Error Ellipse tab in the Contact Feature Properties dialog box and change the values for the error ellipse as required.

The Contact Label and Mine Reference Number cannot be changed.

4. MINSTE Development[8]

MINSTE is a Java[9] based software tool that writes out and reads in data in XML format. The interface was developed using the Java Architecture for XML Binding (JAXB) and so allows for highly portable XML data to be joined to a highly portable Java application resulting in a lightweight flexible application.

The XML schema used in a JAXB[10] implementation uses XML syntax to describe the relationships that must be adhered to, a set of structural rules and data constraints. The XML schema used by MINSTE defines a 'Mission' with its attributes and a collection of 'Contacts'.

The MINSTE application is a concept demonstrator application developed only to enable the transfer of data, using XML, between the MINTACS database and SeeTrack database. The purpose of its development is not to duplicate any functionality of MINTACS and SeeTrack, rather, it is a way of moving data between the databases that these applications use.

Provided as attached appendices are the following software developer notes:

- Appendix A contains the XML schema used by MINSTE,
- Appendix B provides supporting software developer notes,
- Appendix C includes a schematic class diagram for the MINSTE application.

[8] Refer to Irwin, A. (2009) *Design and Evaluation of the MINTACS SeeTrack Exchange (MINSTE) Concept Demonstrator*, DSTO-GD-0574, for more information on the operational context and drivers for MINSTE development.

[9] URL - http://java.sun.com/

[10] URL - https://jaxb.dev.java.net/

5. Using this Manual

5.1 Reference to Computer Terminology

All computer terminology referred to in this manual, unless otherwise stated, is based on the conventions used in the standard Window environment as used in MS Windows environments. This includes all references to window controls and a *virtual* desktop as viewed on a computer screen.

Reference to a *click or select*, unless qualified, refers to the press and release of the left mouse button.

5.2 Typographic Conventions

Directories and file names are distinguished by display in the **Arial 10pt bold font.**

Directory paths (Microsoft file environment) always end in backslash e.g **dsto\MINSTE\documents**

File names always contain file name extension e.g **Mission.xml**

Options or selections are distinguished by display **in Arial 12pt bold font.**

Italics are used to emphasis a word or phrase: to distinguish a name, title of an object or document from the body of text. This includes references to words used to identify objects such as dialog buttons.

5.3 Maintaining this Manual

This document is designed as a User Guide and Reference Manual, to be added to and updated as MINSTE is developed.

6. Installing and Running MINSTE

6.1 Security Considerations

MINSTE is unclassified, however, it is important to realise that the data used or the XML files handled by the MINSTE application may have a security classification associated with it.

6.2 System Requirements

MINSTE can be installed on any desktop computer that is capable of supporting the Java run-time environment (JRE). The application was developed for use on MS Windows platforms.

MINSTE does not need to be installed where the SeeTrack application is installed. It only requires access to the SeeTrack MS Access database.

MINSTE does not need to be installed where the MINTACS application is installed. It only requires access to the MS SQL Server 2000 used by the MINTACS R12 application.

Installing and running MINTSE requires:

a. The installation of the JRE by running **jre-6u5-windows-j586-p.exe**
b. The installation of MINSTE by running **MINSTEsetup.exe**
c. Configure the database connection for MS SQL Server 2000 and / or MS Access.

6.3 Installing Java Run-time Environment

As for all Java based applications, MINSTE requires the JRE to run. In particular, it requires version 6 to execute.

If version 6 of the JRE is not installed run **jre-6u5-windows-j586-p.exe**, this is included with the MINSTE installation CD-ROM. It is also possible to download JRE version 6 from http://www.java.com/en/download/manual.jsp.

Installation of the JRE is as follows:

1. Insert the MINTACS_interface installation CD into the CD ROM drive.
2. Locate the file **jre\jre-6u5-windows-j586-p.exe.**
3. Open the file **jre-6u5-windows-j586-p.exe.**
4. Follow the prompts.
    a. Accept the license agreement
    b. Installation will be conducted automatically. A message dialog appears to inform when the installation is complete.

6.4 Installing MINSTE

The MINSTE application needs to be installed so that it can access the SeeTrack MS Access database and / or the MINTACS databases. Installation configurations can be as follows:

- One instance of MINSTE can be installed on a local computer or workstation and access the databases stored on a separate disk and / or server.
- One instance of MINSTE can be installed on a local computer and access the SeeTrack database stored locally.
- One instance of MINSTE can be installed on a local computer and access the MINTACS databases stored locally on the SQL Server.
- One instance of MINSTE can be installed on a local computer and access both the SeeTrack and MINTACS databases stored locally.

MINSTE is usually installed on a PC from a CD-ROM.

1. Insert the MINSTE CD-ROM into the CD drive
2. Select **MINSTEsetup.exe** on the CD drive
3. Follow the prompts.
    a. Accept default destination folder by selecting **Next** or enter new folder and select **Next**
    b. Accept default Start Menu folder by selecting **Next** or enter new Start Menu folder and select **Next** or choose not to create Start Menu folder and select **Next**
    c. Choose to create a desktop icon and select **Next** or ignore and select **Next**
    d. Confirm installation selections by clicking **Install** or to change select **Back**

6.5 Starting MINSTE

Once MINSTE is installed, the directory produced will contain a Java Archive (JAR) file, MINSTE.jar used to start the MINSTE program.

Double-click on **MINSTE.jar**.

The installer does allow the user to install a short-cut on the desktop and in the Start Menu to run the application.

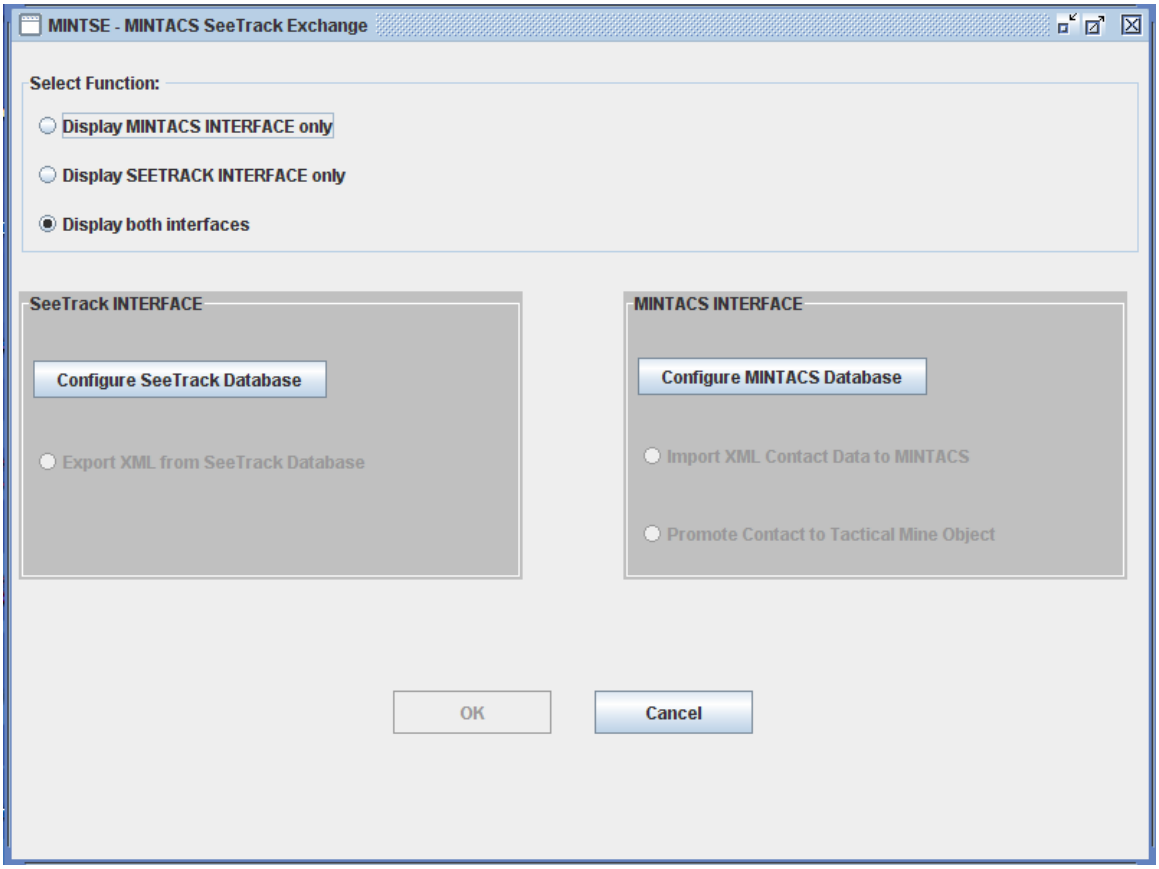


Figure 5: The main window on the initial start-up of the MINSTE application. MINSTE can be run by double-clicking on MINSTE.jar from the installed directory, double-clicking on the desktop shortcut installed or by selecting from the program list menu (from the Start -> Programs menu).

6.6 Configure Database Connection

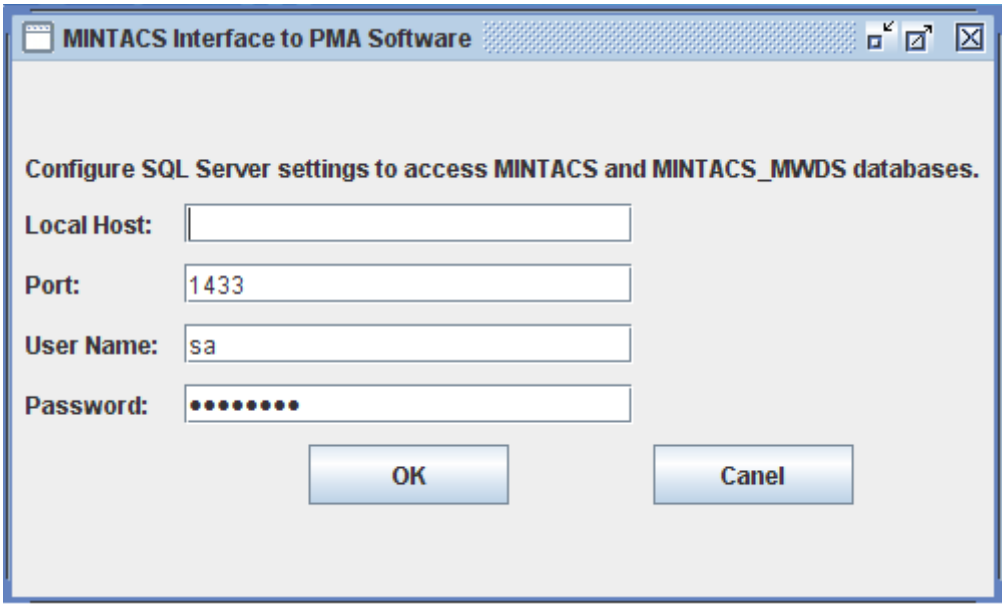
MINSTE interfaces with the MINTACS database MS SQL Server 2000 and the SeeTrack database MS Access.

6.6.1 MINTACS Interface

MINTACS Release 12 uses MS SQL Server 7 / SQL Server 2000 as its database. **Release 1 of MINSTE will only run with MINTACS Release 12 using MS SQL Server 2000.**

Developer notes are included as Appendix B describing a workaround to create a connection between MINSTE and MS SQL Server 7.

1. Select the button **Configure MINTACS Database** from the main window.



2. To configure MS SQL Server 2000 settings, the following is required:
   a. *Local Host* :- this can be accessed by opening the SQL Server Service Manager: Program Files -> Microsoft SQL Server -> Service Manager

   b. *Port* :- the port setting in MINSTE will be set to the default port value for SQL Sever, namely, 1433. To check this or change the port setting access to the default port value can be done in one of two ways:

      - Open the SQL Server Enterprise Manager: **Program Files** -> **Microsoft SQL Server** -> **SQL Server Enterprise Manager**
      - Select **Tools** -> S**QL Server Configuration Properties**
      - *General tab*
      - Select **Network Configuration**
      - Select **Enabled protocols: TCP/IP**
      - Select **Properties**

      OR

      - If the Client Network Utility has been installed (available on the SQL Server installation CD) open this by: **Program Files** ->**Microsoft SQL Server** -> **Client Network Utility**
      - *General tab*
      - Select **Network Configuration**
      - Select **Enabled protocols: TCP/IP**
      - Select **Properties**

   c. *User Name* :- A SQL Server default username will be set. If this default does not work or a new separate login is required then create a new login as per instructions below.

d. *Password* :- The corresponding default user name's password will be set to this value. If this default does not work or a new separate login is required then create a new login as per instructions below.

The user name and password setting in MINTSE will be set to the default username and password for the SQL Server. If this needs to be changed create a new login and set the MINTSE settings to this new login username and password.

To create a new login:

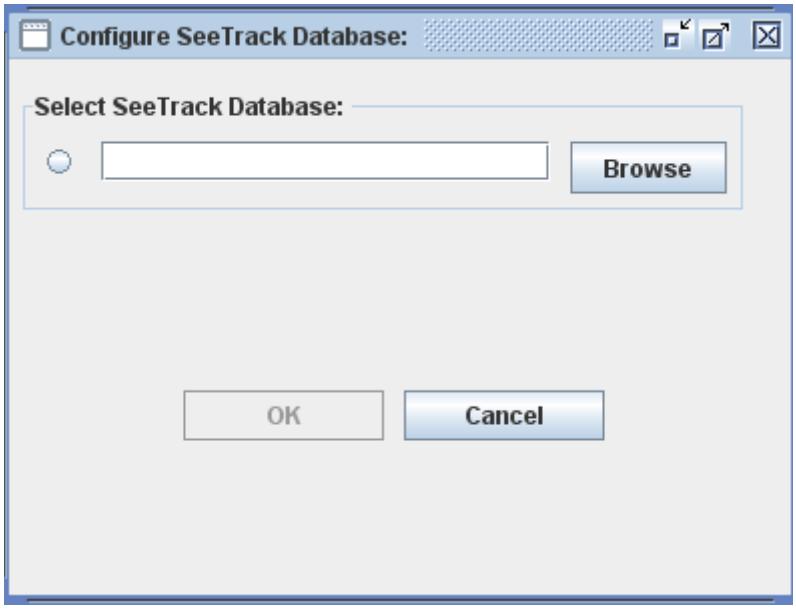
- Open the SQL Server Enterprise Manager: **Program Files** -> **Microsoft SQL Server** -> **SQL Server Enterprise Manager**
- Select **Security** folder in the appropriate SQL Server Group
- Right-click **Logins** and select **New Login**
- *General tab*
- Create a user name in the Name text field
- Select **SQL Server Authentication**
- Enter a password
- Default database = master
- Default Language = English
- *Database Access tab*
- Select **Permit** (green tick) for the MINTACS and MINTACS_MWDS databases
- Database roles selected for the MINTACS and MINTACS_MWDS databases are public and db_owner

3. Select **OK** to configure database settings
4. The MINTACS Interface functionality will then be enabled.

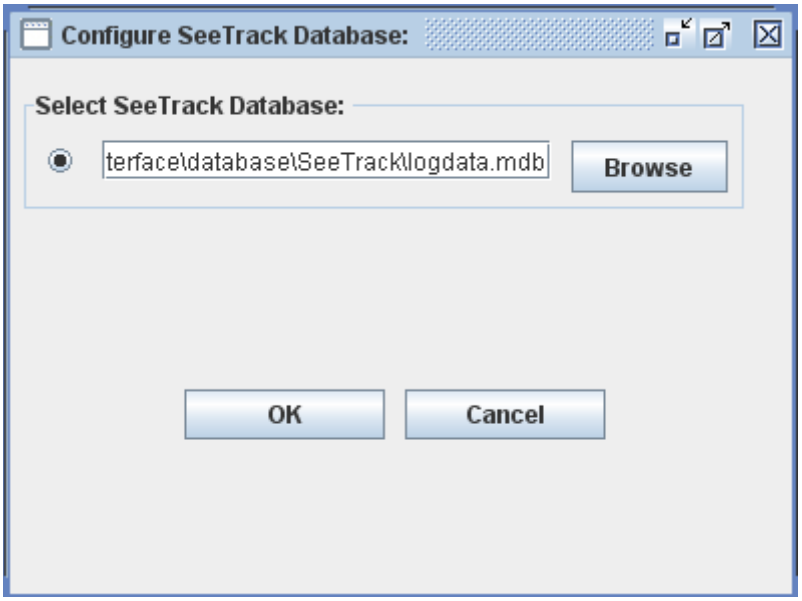
6.6.2 SeeTrack Interface

SeeTrack uses Microsoft Access as its database. MINSTE will interface with MS Access when the MS Access file used by SeeTrack is configured in MINSTE.

1. Select the button **Configure SeeTrack Database** from the main window
2. *Select SeeTrack Database*: Enter in the text field the file location for the SeeTrack database or select Browse to find the database file.



3. Select the radio button next to the file location text field. This will enable the OK button.



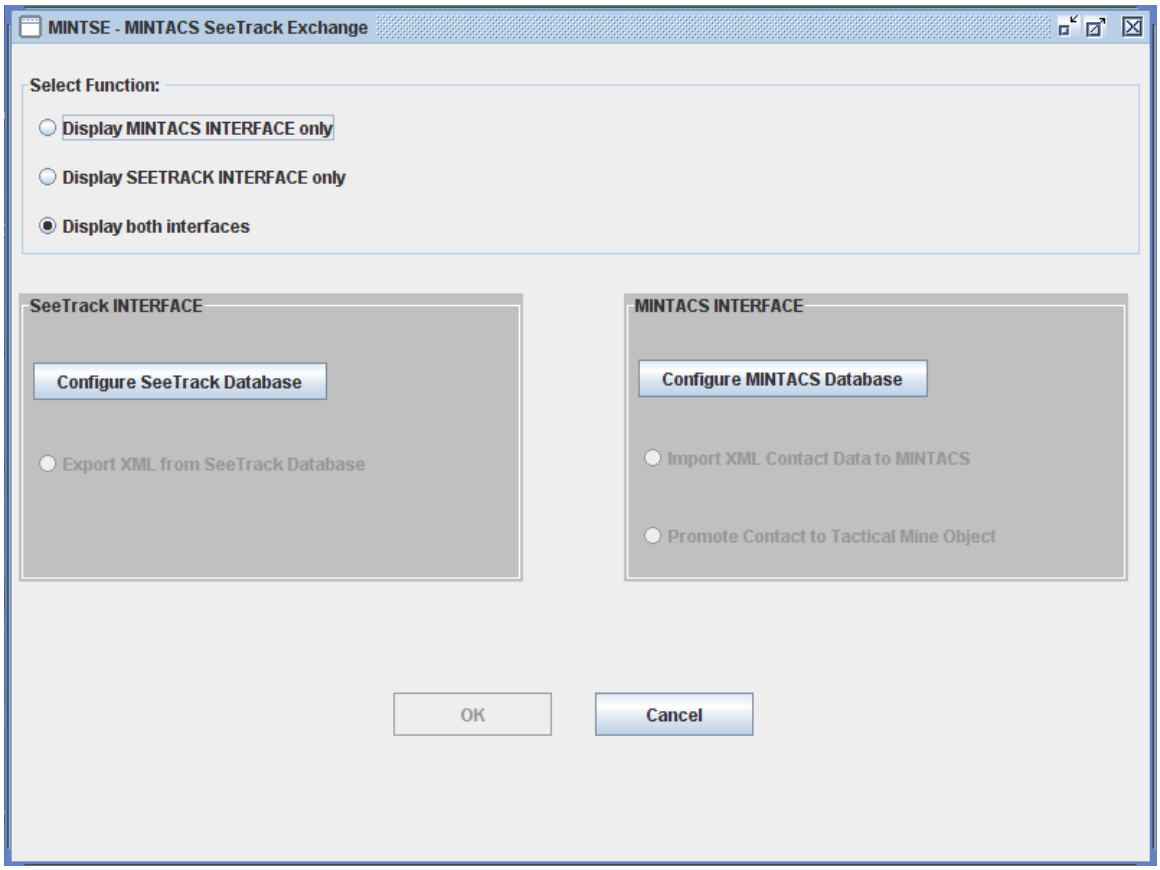
4. Select **OK** to configure the SeeTrack database.
5. The SeeTrack Interface functionality with then be enabled.

7. Using MINSTE

This section provides an overview of using MINSTE.

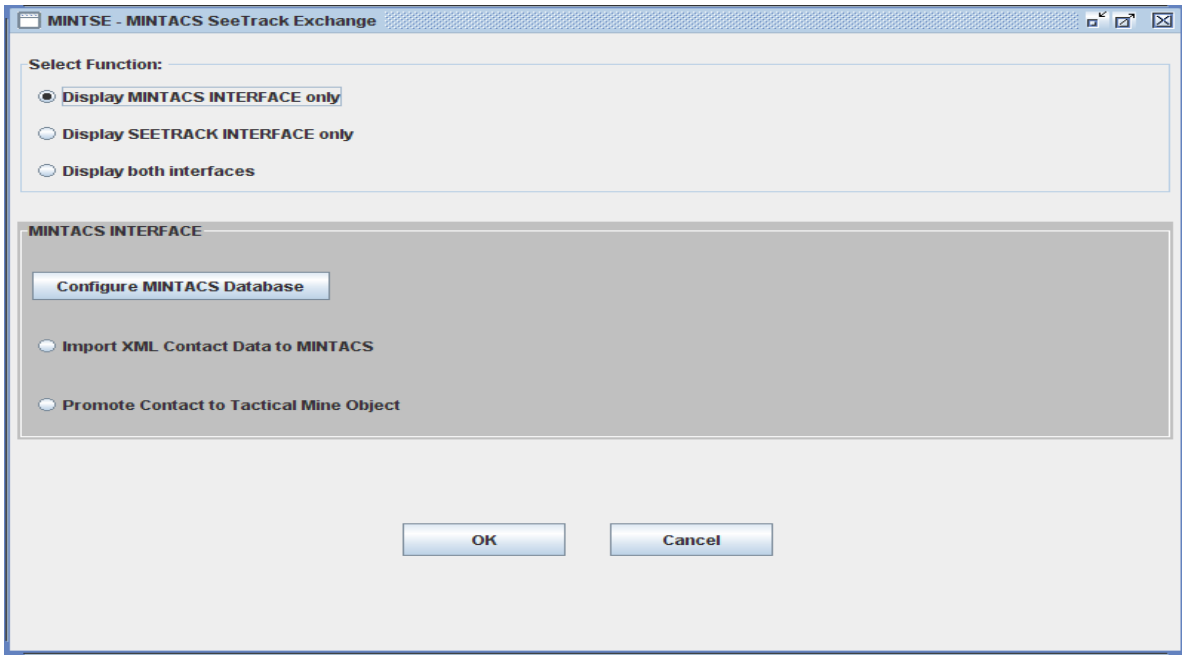
MINSTE is divided up into two sections. One section is the SeeTrack INTERFACE. This provides the functionality to interface with the SeeTrack database. The second section, *MINTACS INTERFACE*, provides the functionality available to interface with MINTACS R12.

MINSTE is used to interface with the SeeTrack MS Access database and the MINTACS R12 MS SQL Server 2000 databases. However, a user may need to use only one part of the interface, to either use the SeeTrack Interface functionality or the MINTACS Interface functionality. It is therefore possible to set-up the main window to filter out unnecessary functionality.

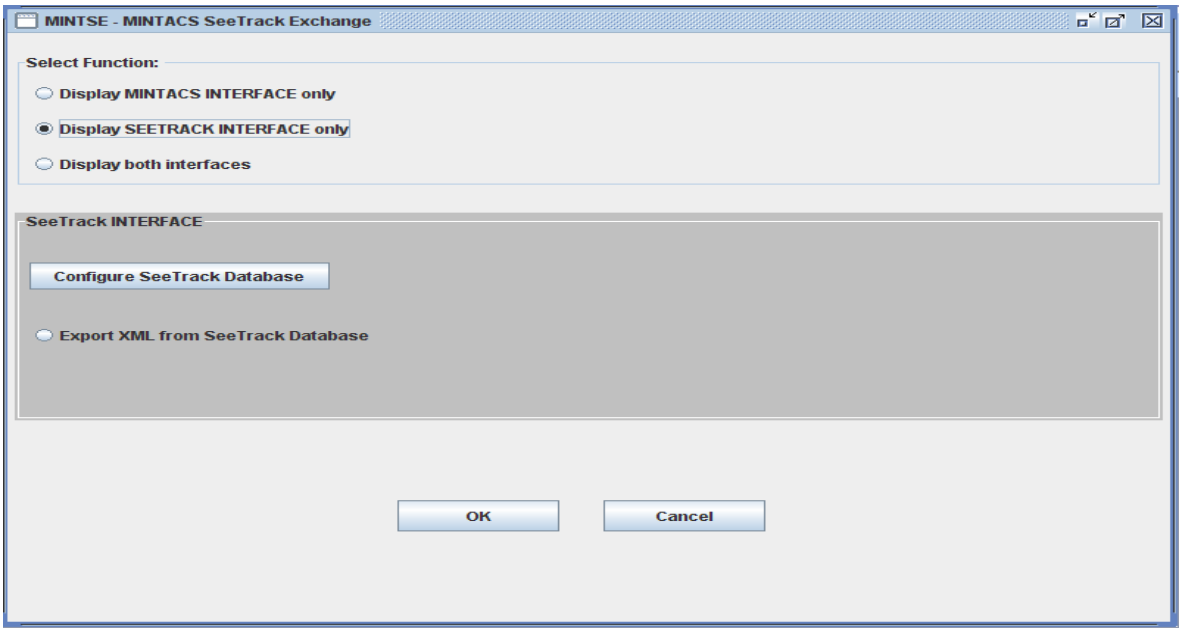


To display all the functionality, select Display both interfaces.

By selecting Display MINTACS INTERFACE only, the user can set up the main display with the MINTACS Interface functions.



By selecting Display SEETRACK INTERFACE only, the user can set up the main display with the SeeTrack Interface functions.



On start-up of a newly installed MINSTE application both interfaces will be displayed. The user can set up the display of the main window to their preferred setting and this setting will then be saved.

To enable MINSTE functionality to be available each database used by MINSTE must be configured correctly. The settings are saved so this configuration needs only to be done once. Refer to 6.6 Configure Database Connections.

The most likely situation for the use of this software is that it will be run on two computers and used for two differing functions.

PMA will be conducted by the SeeTrack software and so MINSTE will need to be installed on the computer which is running SeeTrack. To transfer the contact data identified and stored in the SeeTrack database the user will select **Export XML from SeeTrack Database** to export the required data to an XML file.

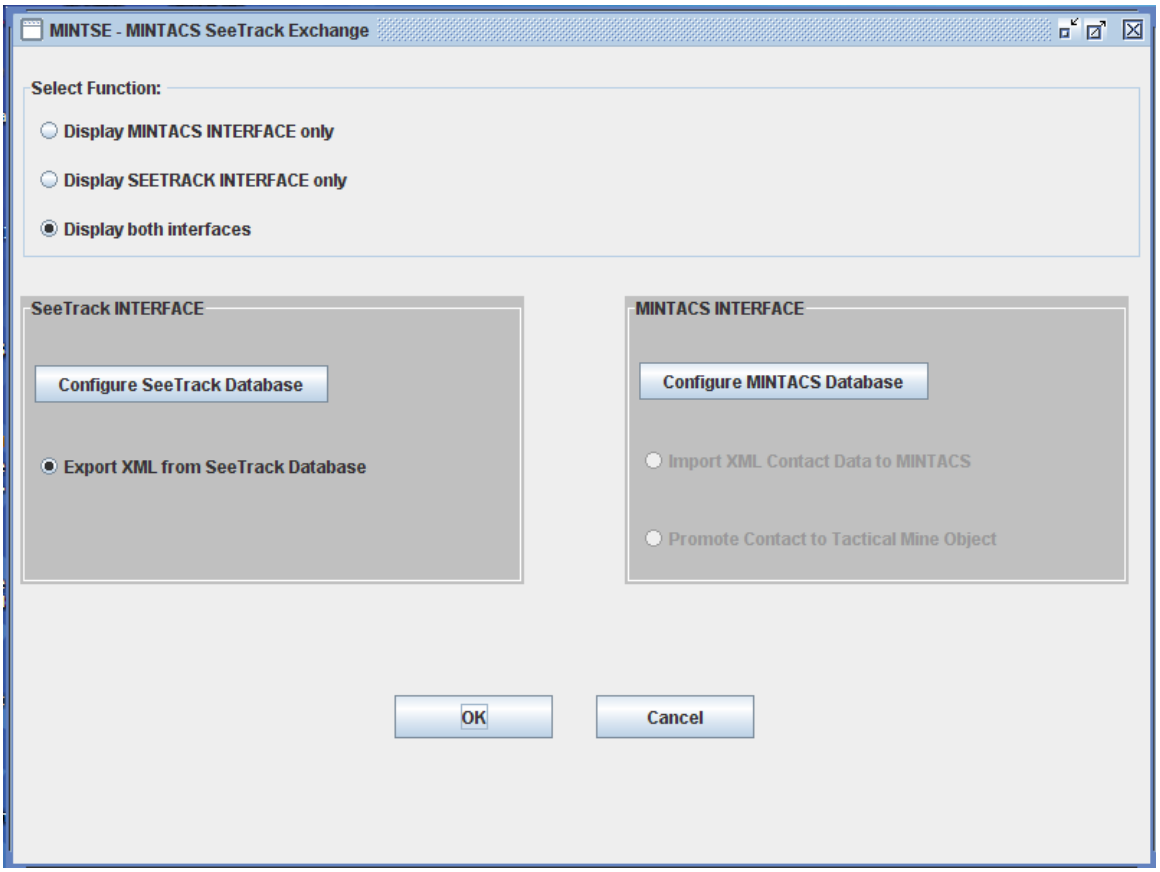
Another instance of MINSTE will also need to be installed on the computer running MINTACS R12. To continue the data exchange the XML file exported from the SeeTrack database (or one previously exported from the SeeTrack database by MINSTE) will then be imported into the MINTACS RSDB by selecting **Import XML Contact Data to MINTACS**. The contacts will then be displayed by the MINTACS Operational Area Manager (OAM).

To further assist in the management of the data being stored in MINTACS an additional feature was developed to promote a contact currently stored in the MINTACS RSDB and displayed in the OAM to being a mine object in the Tactical Display and stored as a new entity in the MINTACS database. This function is activated by selecting **Promote Contact to Tactical Mine Object**.

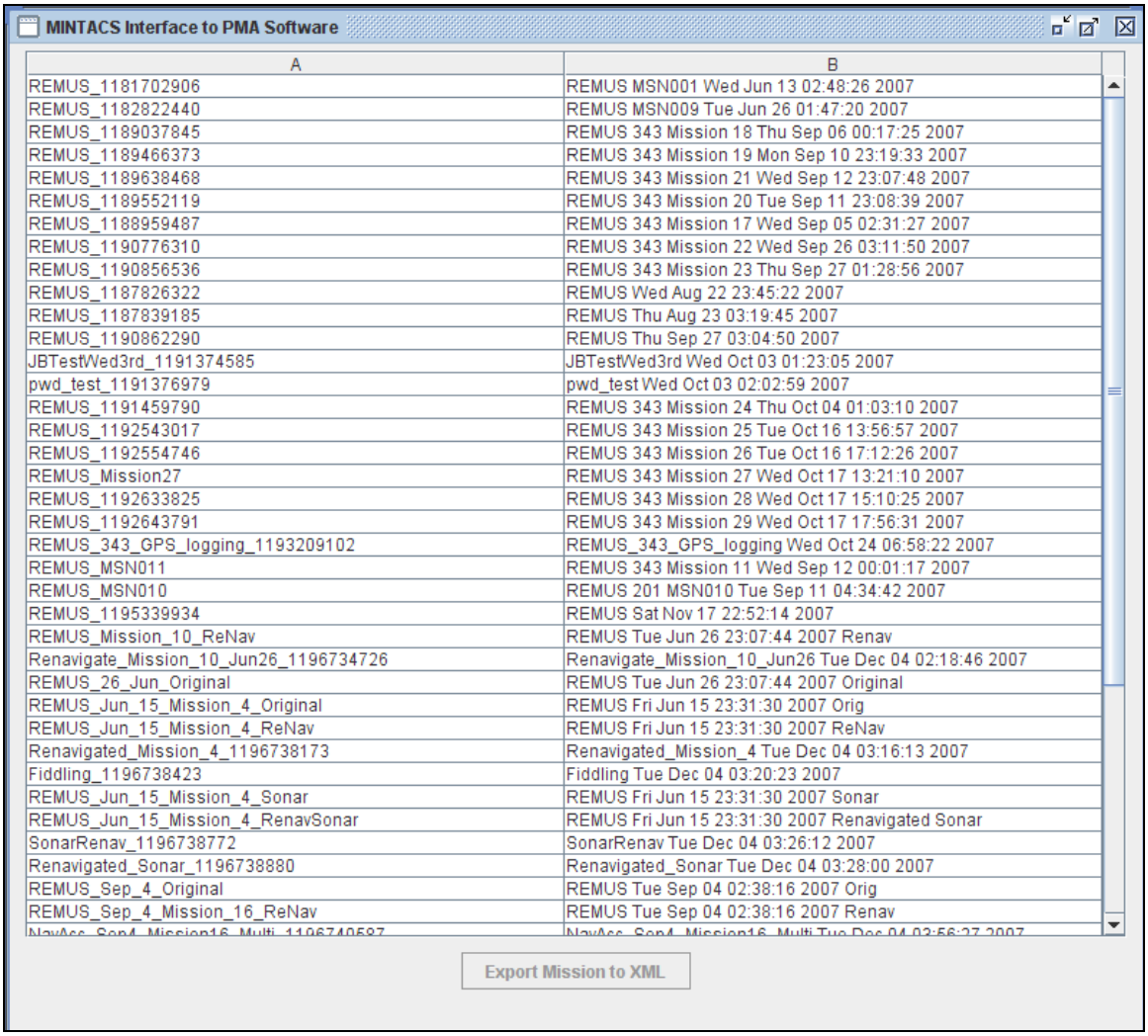
7.1 PMA Software Interface

7.1.1 Export XML from SeeTrack Database

1. Select the radio button to choose *Export XML from SeeTrack Database*. This will enable the OK button.
2. Select the **OK** button.

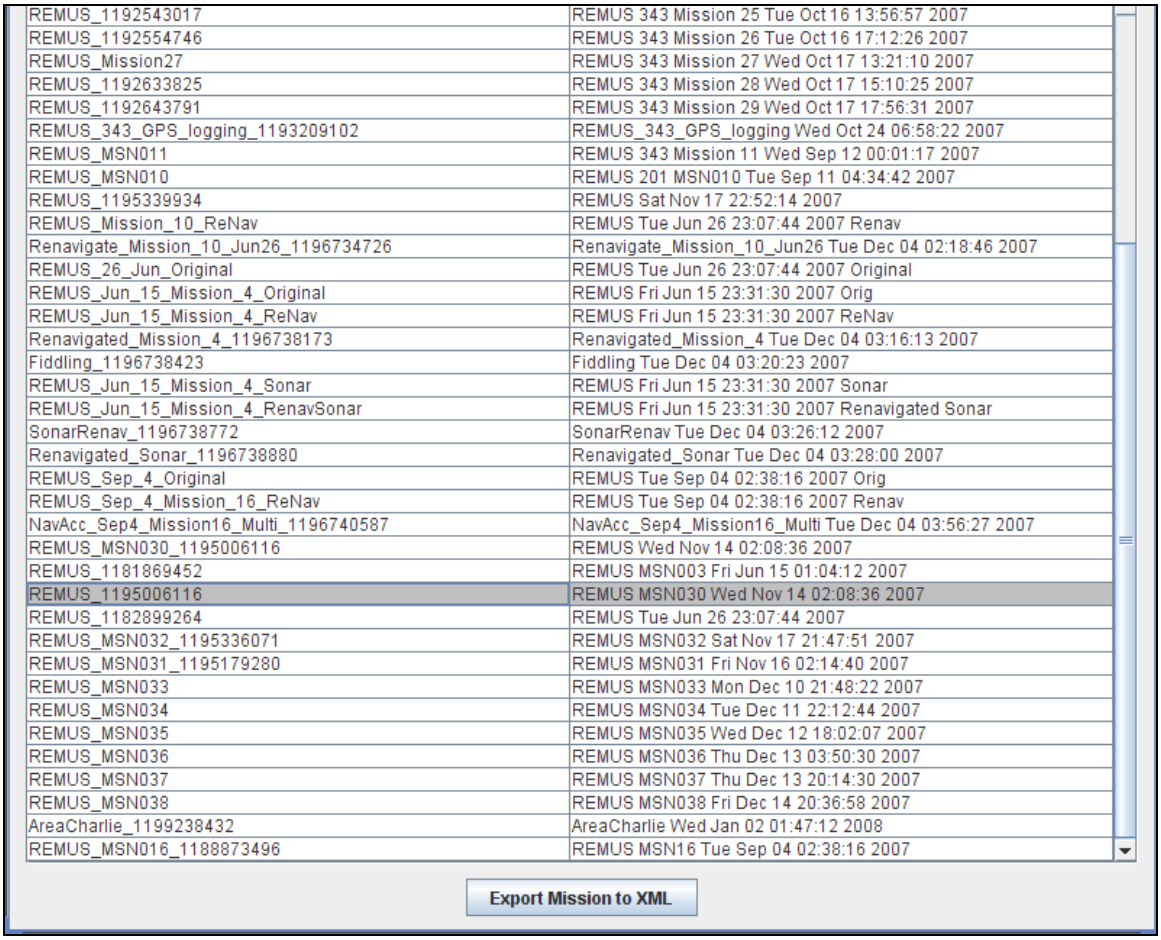


3. All the missions and their descriptions stored in the configured SeeTrack database will be displayed.

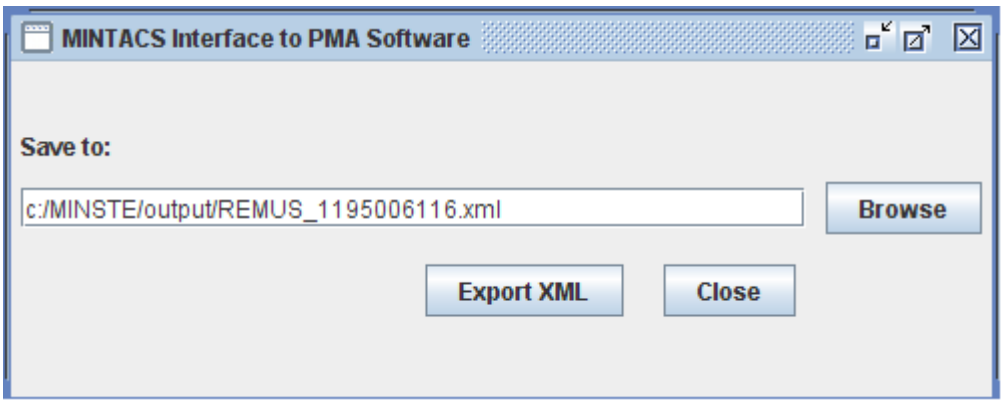


A	B
REMUS_1181702906	REMUS MSN001 Wed Jun 13 02:48:26 2007
REMUS_1182822440	REMUS MSN009 Tue Jun 26 01:47:20 2007
REMUS_1189037845	REMUS 343 Mission 18 Thu Sep 06 00:17:25 2007
REMUS_1189466373	REMUS 343 Mission 19 Mon Sep 10 23:19:33 2007
REMUS_1189638468	REMUS 343 Mission 21 Wed Sep 12 23:07:48 2007
REMUS_1189552119	REMUS 343 Mission 20 Tue Sep 11 23:08:39 2007
REMUS_1188959487	REMUS 343 Mission 17 Wed Sep 05 02:31:27 2007
REMUS_1190776310	REMUS 343 Mission 22 Wed Sep 26 03:11:50 2007
REMUS_1190856536	REMUS 343 Mission 23 Thu Sep 27 01:28:56 2007
REMUS_1187826322	REMUS Wed Aug 22 23:45:22 2007
REMUS_1187839185	REMUS Thu Aug 23 03:19:45 2007
REMUS_1190862290	REMUS Thu Sep 27 03:04:50 2007
JBTestWed3rd_1191374585	JBTestWed3rd Wed Oct 03 01:23:05 2007
pwd_test_1191376979	pwd_test Wed Oct 03 02:02:59 2007
REMUS_1191459790	REMUS 343 Mission 24 Thu Oct 04 01:03:10 2007
REMUS_1192543017	REMUS 343 Mission 25 Tue Oct 16 13:56:57 2007
REMUS_1192554746	REMUS 343 Mission 26 Tue Oct 16 17:12:26 2007
REMUS_Mission27	REMUS 343 Mission 27 Wed Oct 17 13:21:10 2007
REMUS_1192633825	REMUS 343 Mission 28 Wed Oct 17 15:10:25 2007
REMUS_1192643791	REMUS 343 Mission 29 Wed Oct 17 17:56:31 2007
REMUS_343_GPS_logging_1193209102	REMUS_343_GPS_logging Wed Oct 24 06:58:22 2007
REMUS_MSN011	REMUS 343 Mission 11 Wed Sep 12 00:01:17 2007
REMUS_MSN010	REMUS 201 MSN010 Tue Sep 11 04:34:42 2007
REMUS_1195339934	REMUS Sat Nov 17 22:52:14 2007
REMUS_Mission_10_ReNav	REMUS Tue Jun 26 23:07:44 2007 Renav
Renavigate_Mission_10_Jun26_1196734726	Renavigate_Mission_10_Jun26 Tue Dec 04 02:18:46 2007
REMUS_26_Jun_Original	REMUS Tue Jun 26 23:07:44 2007 Original
REMUS_Jun_15_Mission_4_Original	REMUS Fri Jun 15 23:31:30 2007 Orig
REMUS_Jun_15_Mission_4_ReNav	REMUS Fri Jun 15 23:31:30 2007 ReNav
Renavigated_Mission_4_1196738173	Renavigated_Mission_4 Tue Dec 04 03:16:13 2007
Fiddling_1196738423	Fiddling Tue Dec 04 03:20:23 2007
REMUS_Jun_15_Mission_4_Sonar	REMUS Fri Jun 15 23:31:30 2007 Sonar
REMUS_Jun_15_Mission_4_RenavSonar	REMUS Fri Jun 15 23:31:30 2007 Renavigated Sonar
SonarRenav_1196738772	SonarRenav Tue Dec 04 03:26:12 2007
Renavigated_Sonar_1196738880	Renavigated_Sonar Tue Dec 04 03:28:00 2007
REMUS_Sep_4_Original	REMUS Tue Sep 04 02:38:16 2007 Orig
REMUS_Sep_4_Mission_16_ReNav	REMUS Tue Sep 04 02:38:16 2007 Renav

4. Highlight the mission to export.
5. Select the **Export Mission to XML button**.

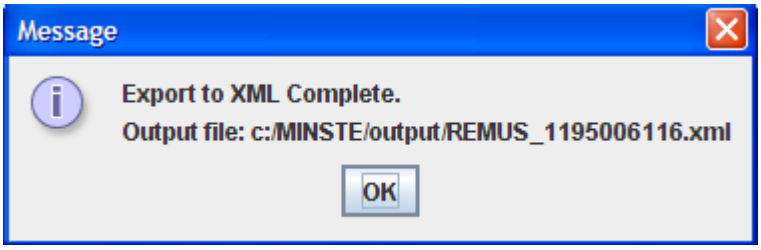


6. A dialog message box will be displayed detailing a default directory location where the selected mission output file can be saved. This is in the format **c:\MINSTE\output\MISSION_NAME.xml.** It is possible to select a user preferred location for the file to be saved to by selecting the Browse button.



7. Select Export XML for the file to be saved.

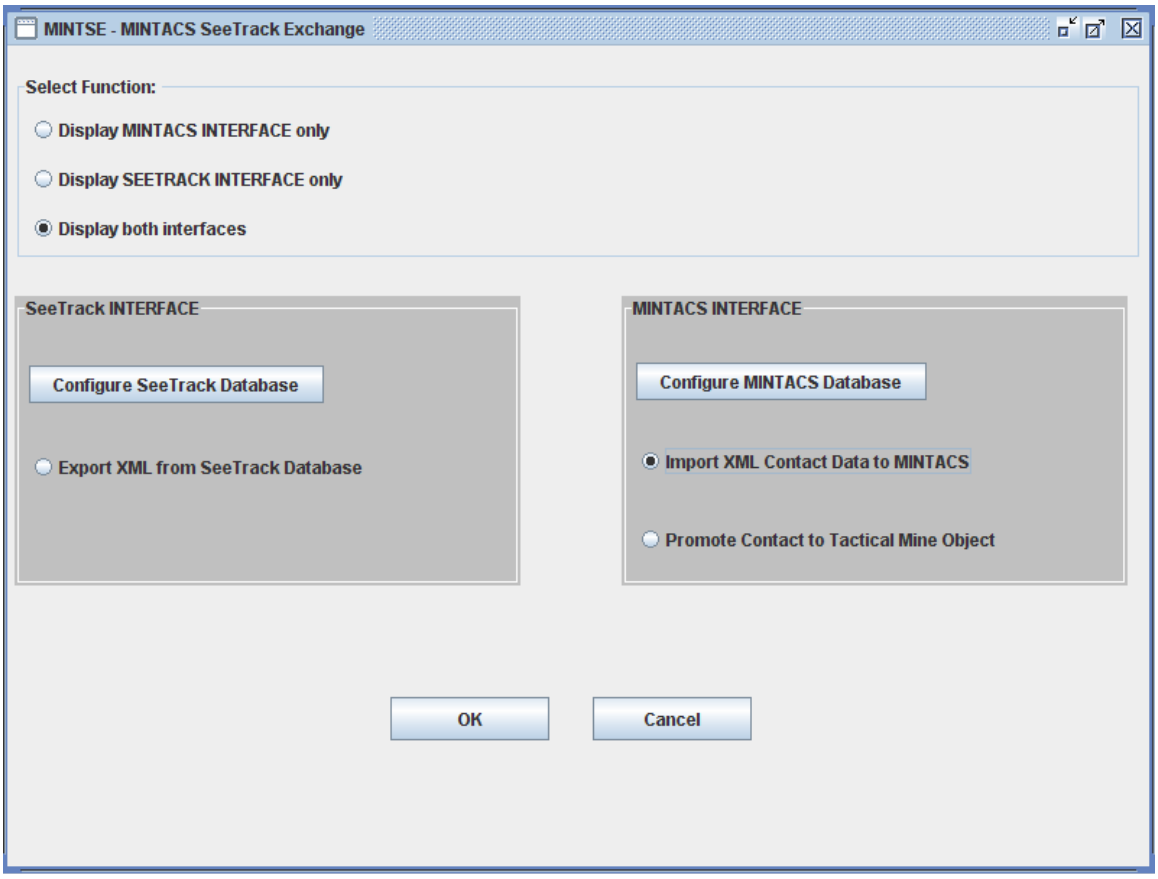
8. On completion a dialog box will be display detailing the output files location.



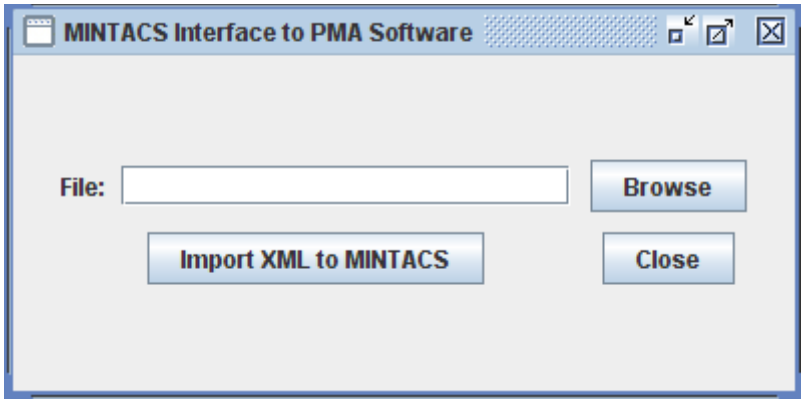
7.2 MINTACS INTERFACE

7.2.1 Import XML Contact Data to MINTACS

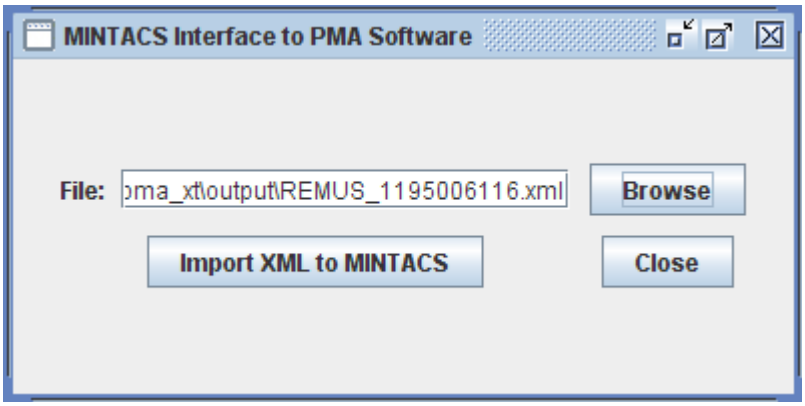
1. Select the radio button to choose *Import XML Contact Data to MINTACS (MINTacs Operation Area Manager)*. This will enable the OK button.
2. Select the **OK** button.



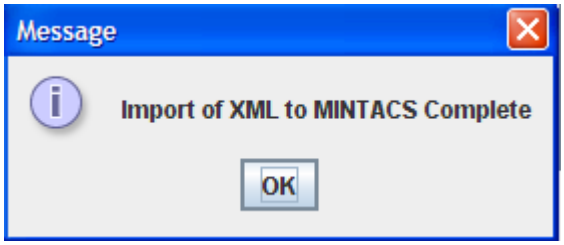
3. Enter the file to import and its location in the text field or select **Browse** to choose the file to import.



4. Select **Import XML to MINTACS**



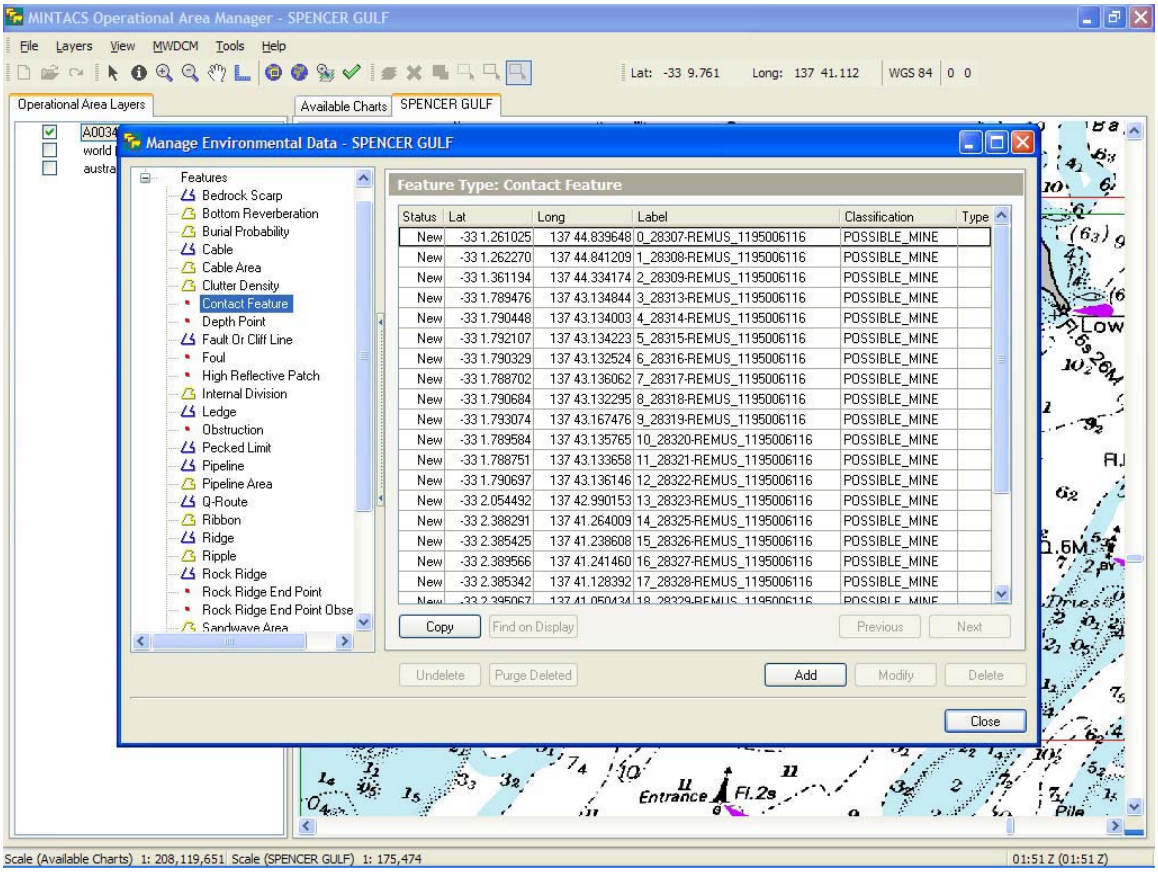
5. On completion of the import process a message dialog box will appear to notify the user.



7.2.1.1 MINTACS Display of Imported Contact Data

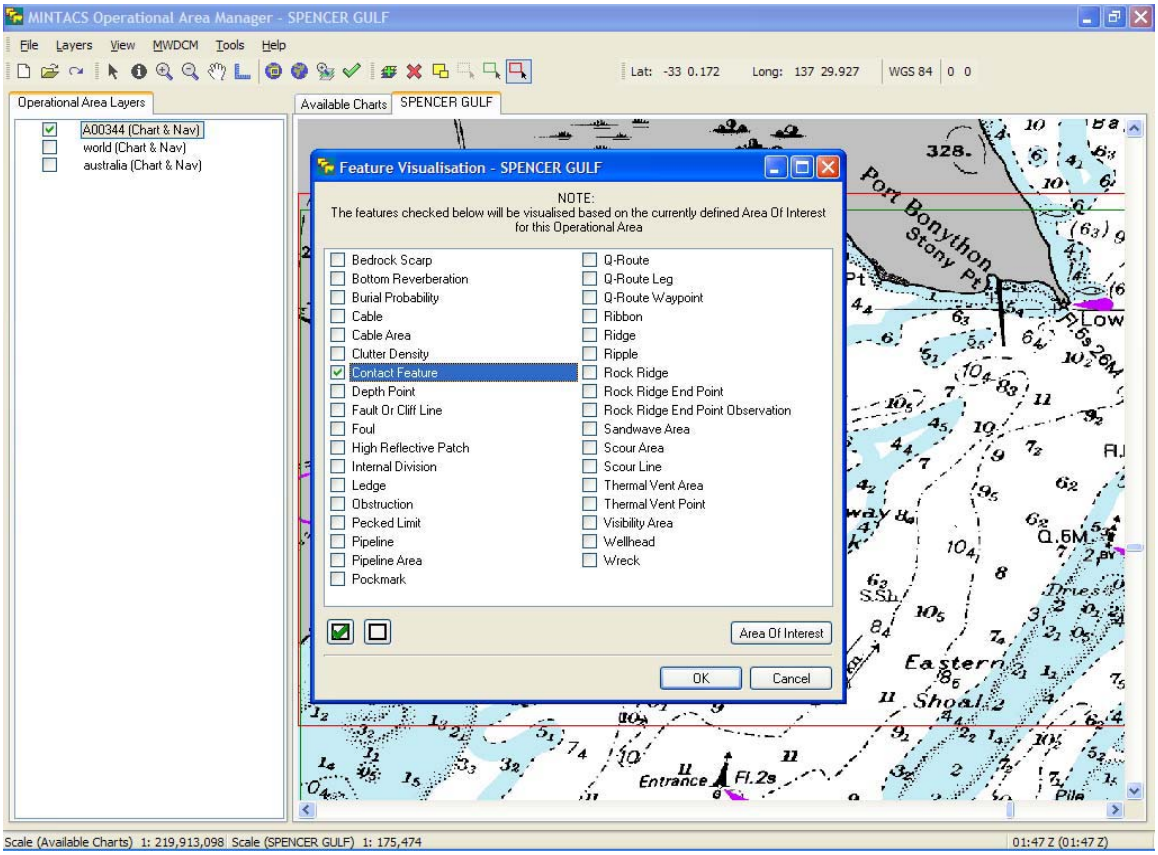
To review the contact data in MINTACS Operational Area Manager:

1. From the **MWDCM** menu, select **Manage Environmental Data**.
2. Select **Contact Feature**
3. All the contacts within the area of interest track will be displayed.

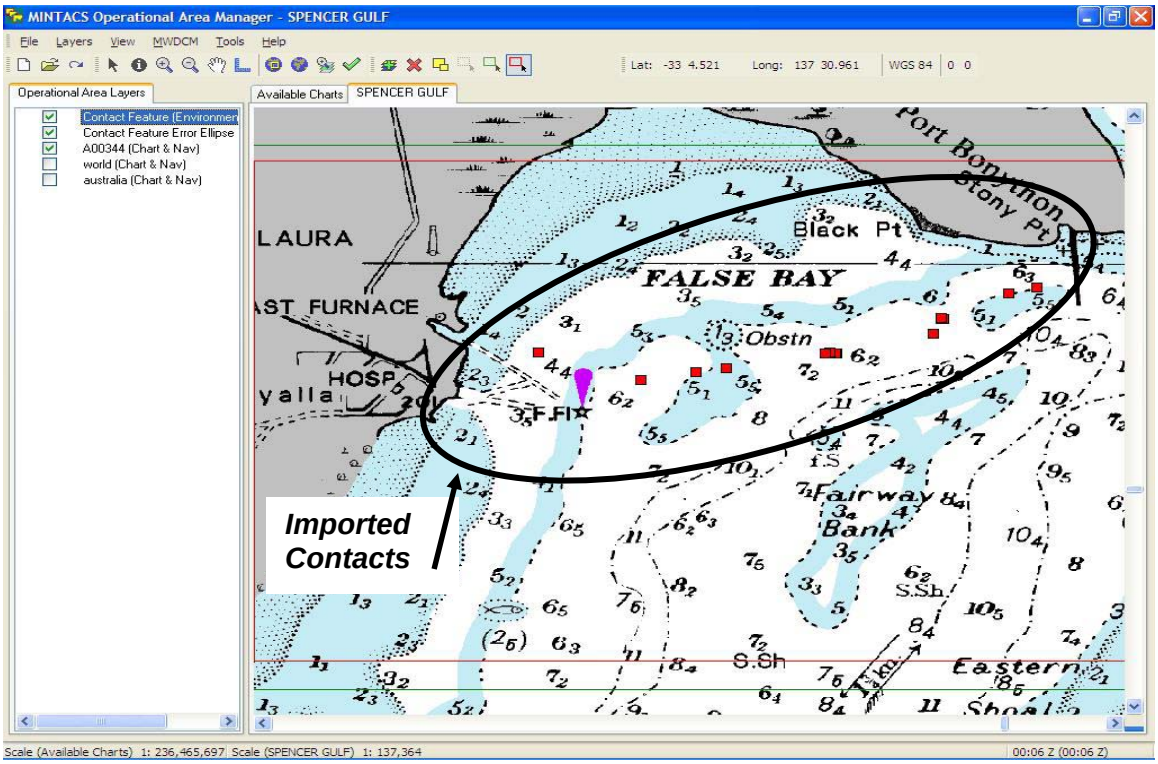


To display the contact data in MINTACS Operational Area Manager:

1. From the **MWDCM** menu, select **Visualise**
2. Select **Contact Feature**
3. Select **OK**

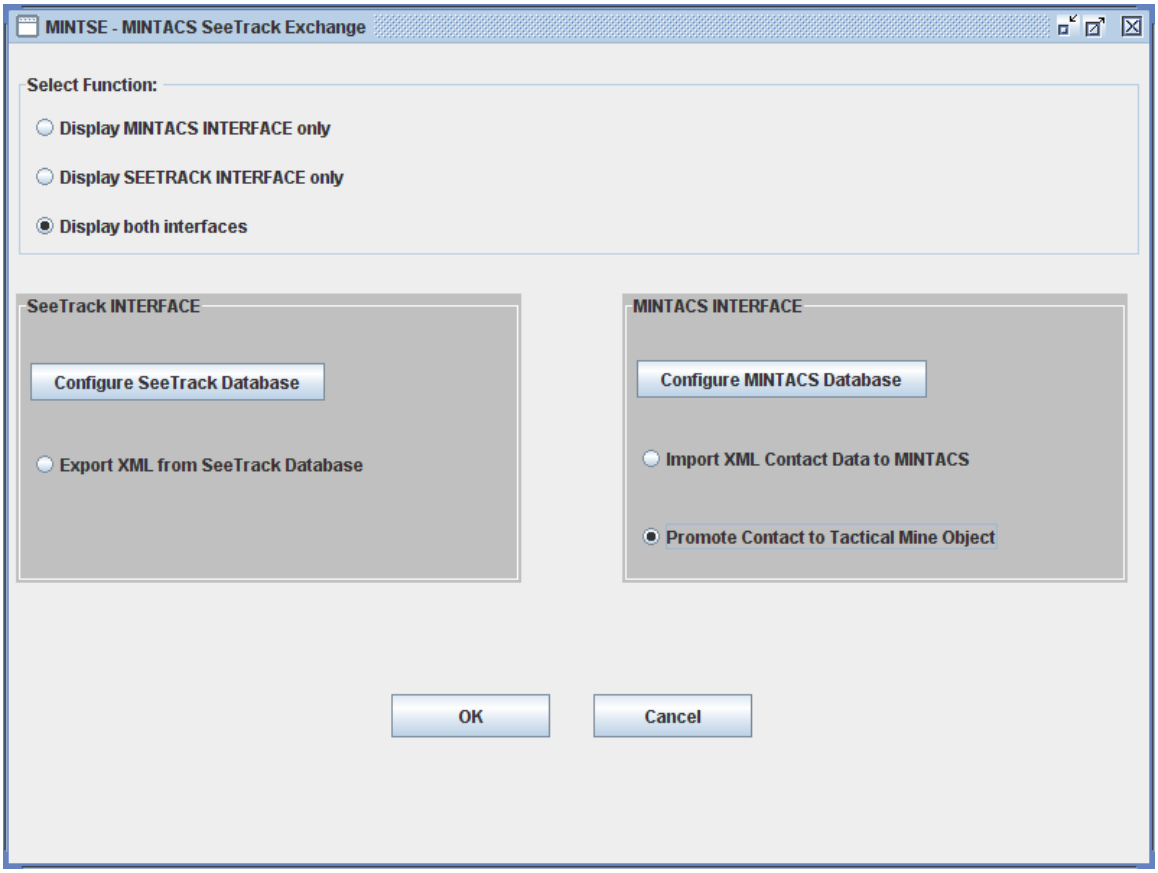


4. All the contacts within the area of interest track will be displayed on the map.

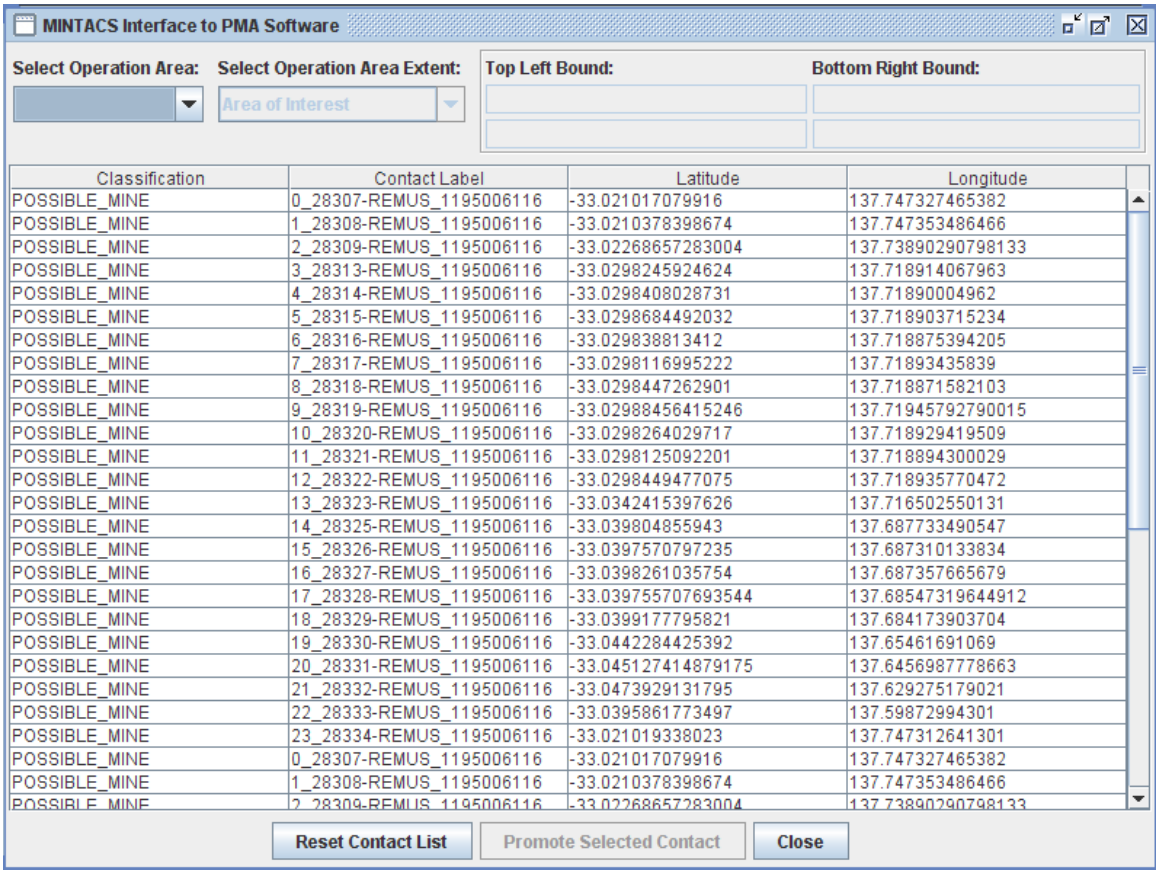


7.2.2 Promote Contact to Tactical Mine Object

1. Select the radio button to choose *Promote Contact to Tactical Mine Object (MINTacs Tactical Display)*. This will enable the OK button.
2. Select the **OK** button.

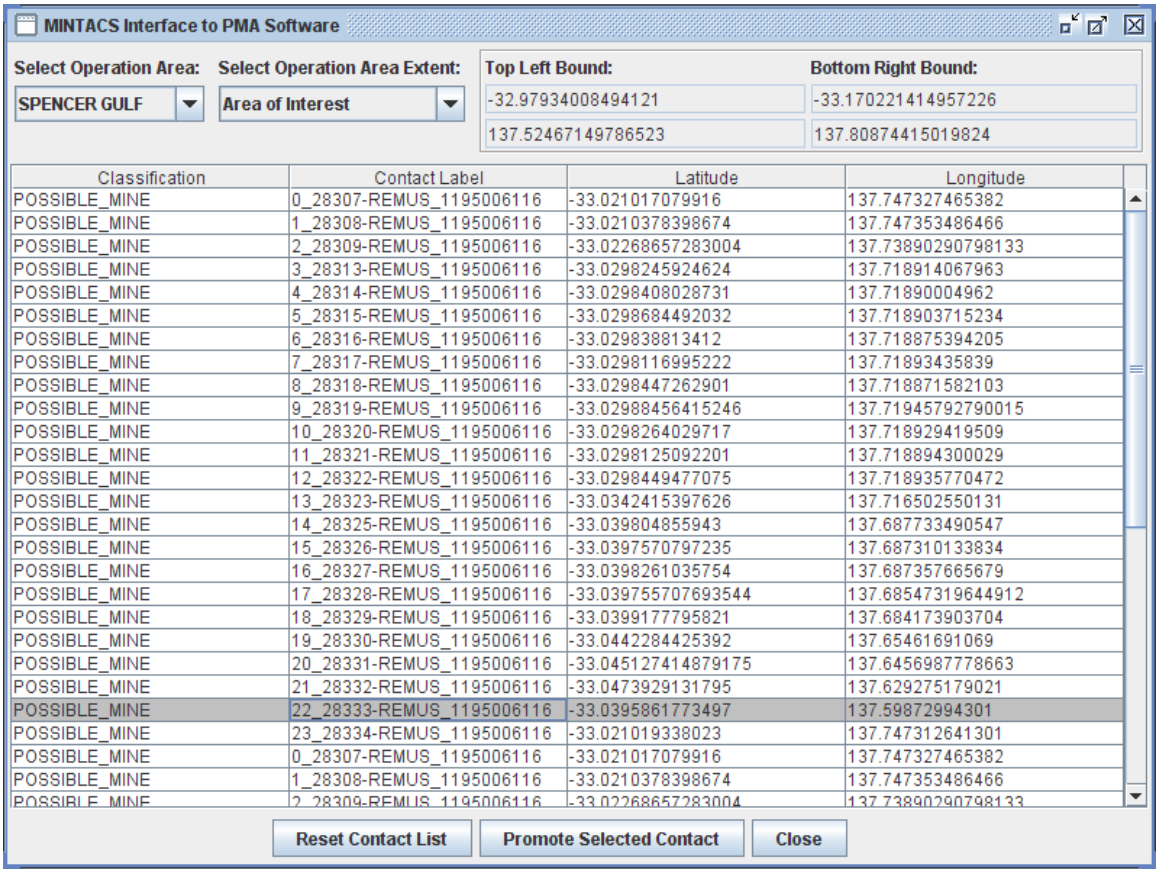


3. All the contacts currently stored in the MINTACS RSDB will be displayed. It is possible to filter the contacts on the Operation Area and Area Extent Type: Area of Interest or Operational Area.



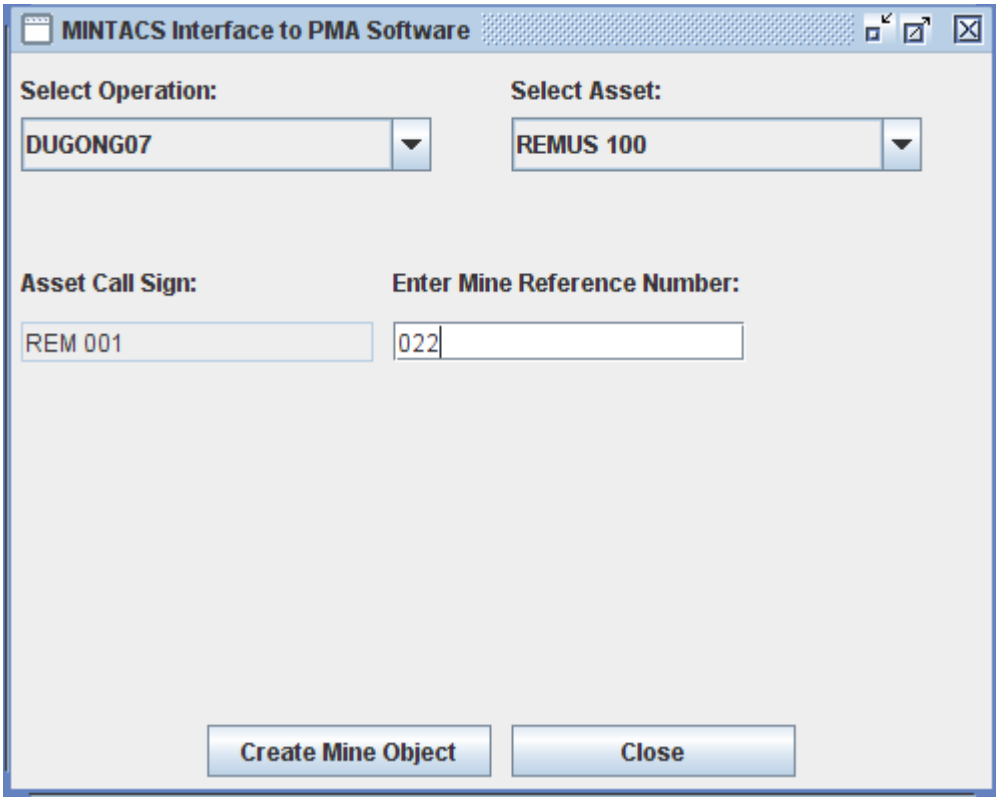
Classification	Contact Label	Latitude	Longitude
POSSIBLE_MINE	0_28307-REMUS_1195006116	-33.021017079916	137.747327465382
POSSIBLE_MINE	1_28308-REMUS_1195006116	-33.0210378398674	137.747353486466
POSSIBLE_MINE	2_28309-REMUS_1195006116	-33.02268657283004	137.73890290798133
POSSIBLE_MINE	3_28313-REMUS_1195006116	-33.0298245924624	137.718914067963
POSSIBLE_MINE	4_28314-REMUS_1195006116	-33.0298408028731	137.71890004962
POSSIBLE_MINE	5_28315-REMUS_1195006116	-33.0298684492032	137.718903715234
POSSIBLE_MINE	6_28316-REMUS_1195006116	-33.029838813412	137.718875394205
POSSIBLE_MINE	7_28317-REMUS_1195006116	-33.0298116995222	137.71893435839
POSSIBLE_MINE	8_28318-REMUS_1195006116	-33.0298447262901	137.718871582103
POSSIBLE_MINE	9_28319-REMUS_1195006116	-33.02988456415246	137.71945792790015
POSSIBLE_MINE	10_28320-REMUS_1195006116	-33.0298264029717	137.718929419509
POSSIBLE_MINE	11_28321-REMUS_1195006116	-33.0298125092201	137.718894300029
POSSIBLE_MINE	12_28322-REMUS_1195006116	-33.0298449477075	137.718935770472
POSSIBLE_MINE	13_28323-REMUS_1195006116	-33.0342415397626	137.716502550131
POSSIBLE_MINE	14_28325-REMUS_1195006116	-33.039804855943	137.687733490547
POSSIBLE_MINE	15_28326-REMUS_1195006116	-33.0397570797235	137.687310133834
POSSIBLE_MINE	16_28327-REMUS_1195006116	-33.0398261035754	137.687357665679
POSSIBLE_MINE	17_28328-REMUS_1195006116	-33.039755707693544	137.68547319644912
POSSIBLE_MINE	18_28329-REMUS_1195006116	-33.0399177795821	137.684173903704
POSSIBLE_MINE	19_28330-REMUS_1195006116	-33.0442284425392	137.65461691069
POSSIBLE_MINE	20_28331-REMUS_1195006116	-33.045127414879175	137.6456987778663
POSSIBLE_MINE	21_28332-REMUS_1195006116	-33.0473929131795	137.629275179021
POSSIBLE_MINE	22_28333-REMUS_1195006116	-33.0395861773497	137.59872994301
POSSIBLE_MINE	23_28334-REMUS_1195006116	-33.021019338023	137.747312641301
POSSIBLE_MINE	0_28307-REMUS_1195006116	-33.021017079916	137.747327465382
POSSIBLE_MINE	1_28308-REMUS_1195006116	-33.0210378398674	137.747353486466
POSSIBLE_MINE	2_28309-REMUS_1195006116	-33.02268657283004	137.73890290798133

4. Highlight the contact to promote and select **Promote Selected Contact**.

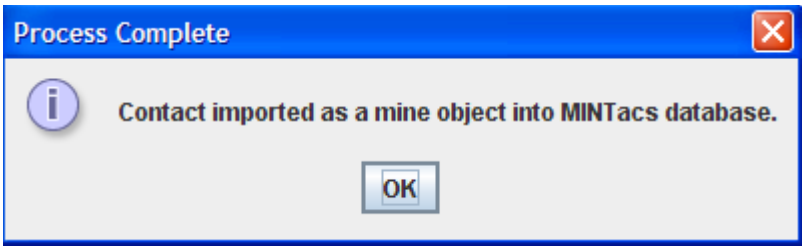


5. The MINTACS database will require the following information:

    a. Operation: - select the operation from a list of currently available operations for the selected Operational Area.
    b. Asset: - select the asset from a list of currently available assets for the operation
    c. Enter a mine reference number. The mine object will then be identified in the MINTACS database and the Tactical Display as ASSETCALLSIGN_MINEREFERENCE NUMBER.

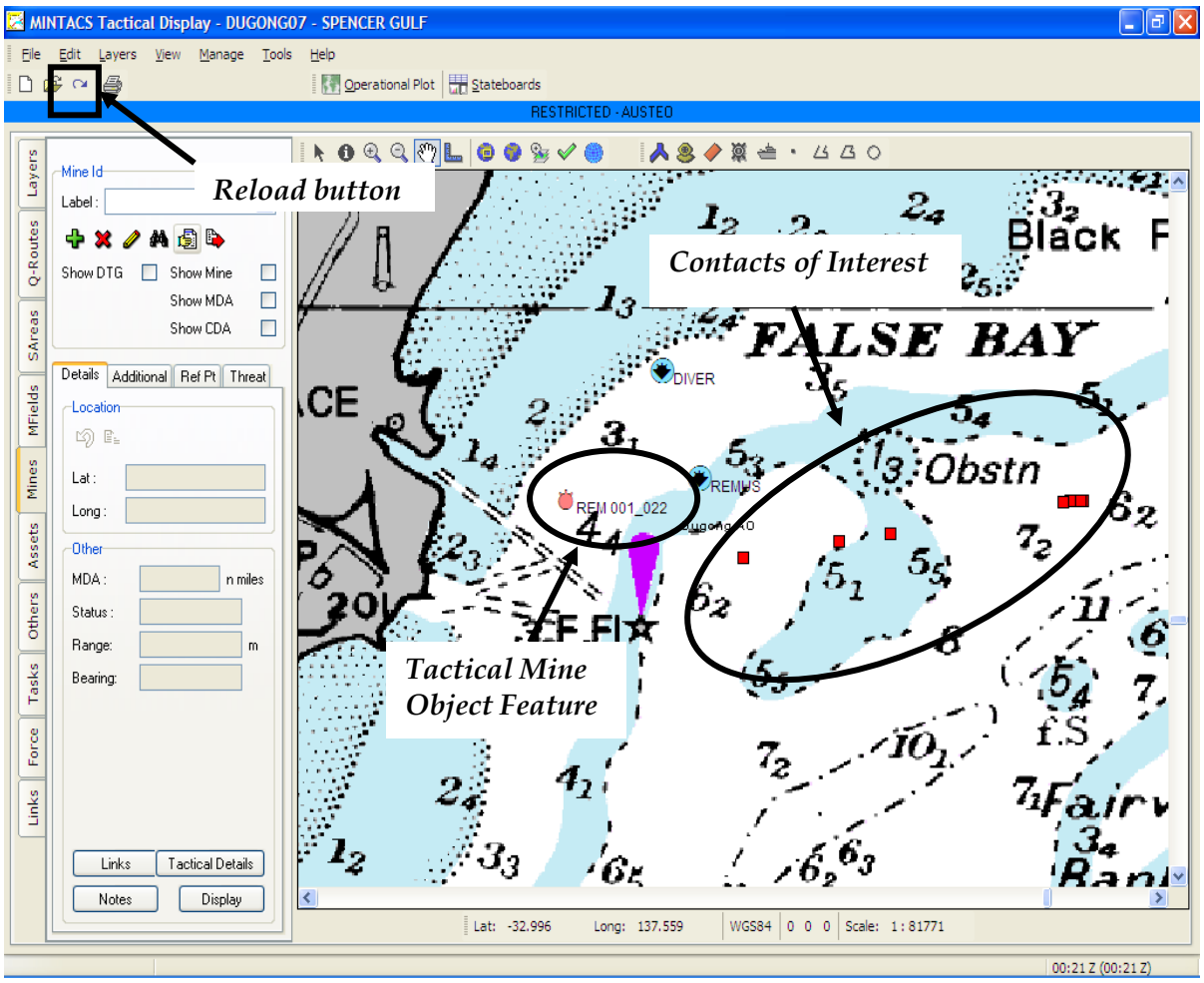


6. Select **Create Mine Object**
7. On completion of the promotion process a message dialog box will appear to notify the user.



7.2.2.1 *MINTACS Display of Promoted Mine Object*

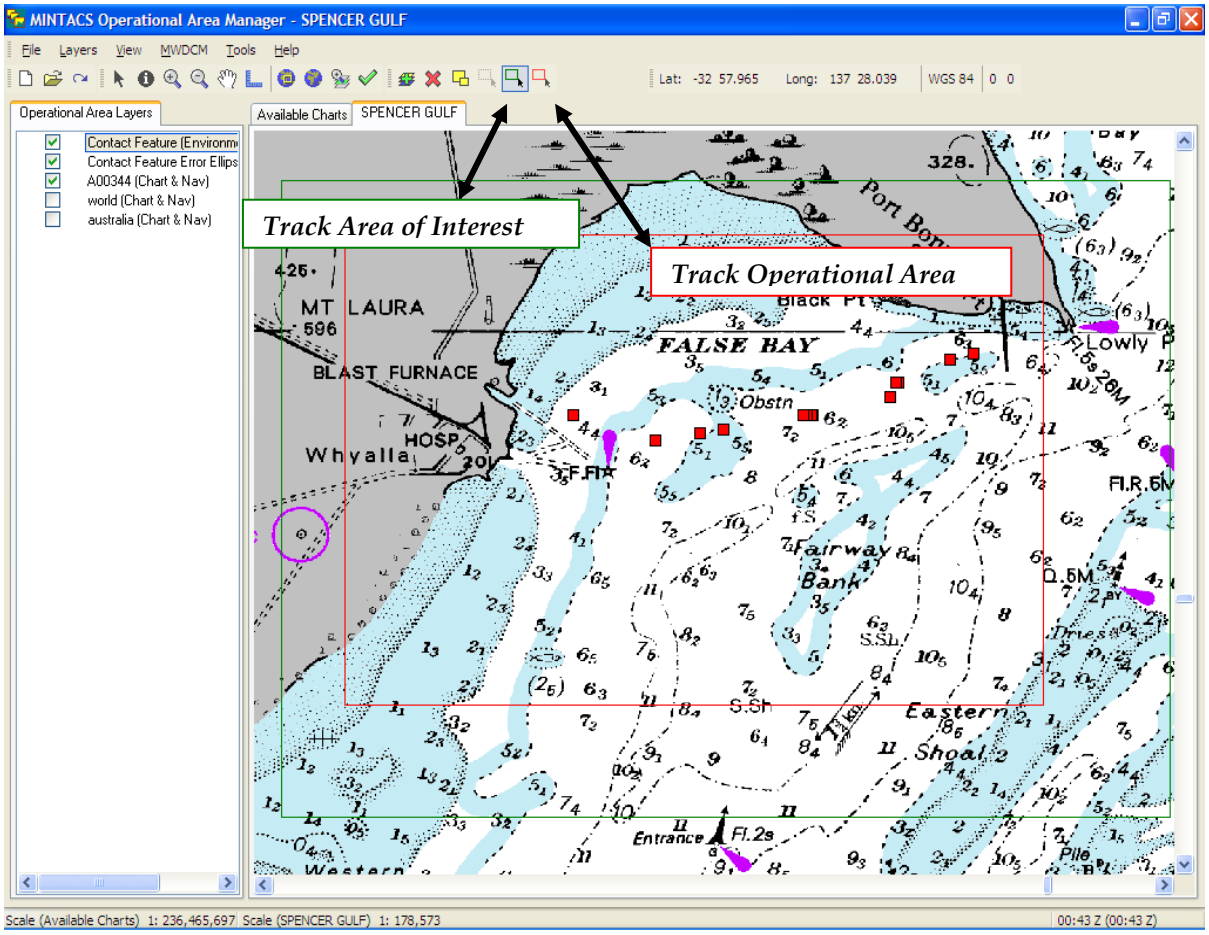
The promoted contact will be displayed as a mine object in the MINTACS Tactical Display. The mine object will be displayed by opening the *operation* in for which it was created. If the operation is currently open in the MINTACS Tactical Display then select the **Reload** button.



7.2.3 Filter MINTACS RSDB Contacts by MINTACS Functionality: Track Area of Interest or Track Operational Area

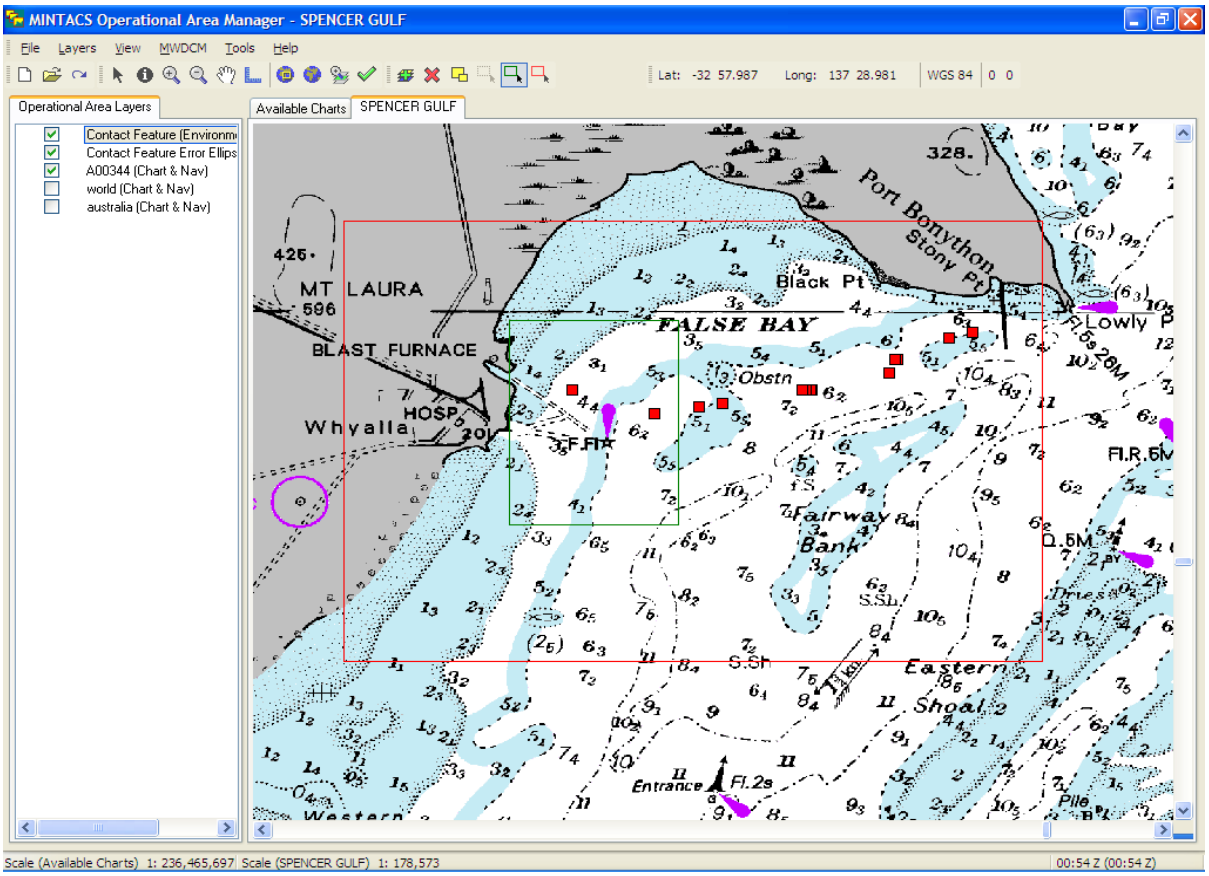
It is possible to filter the list of contacts by drawing the area of interest or operational area track around one contact or a select few contacts in MINTACS.

Contacts will be displayed in the *MINTACS Operational Area Manager* within the *Area of Interest Track.*

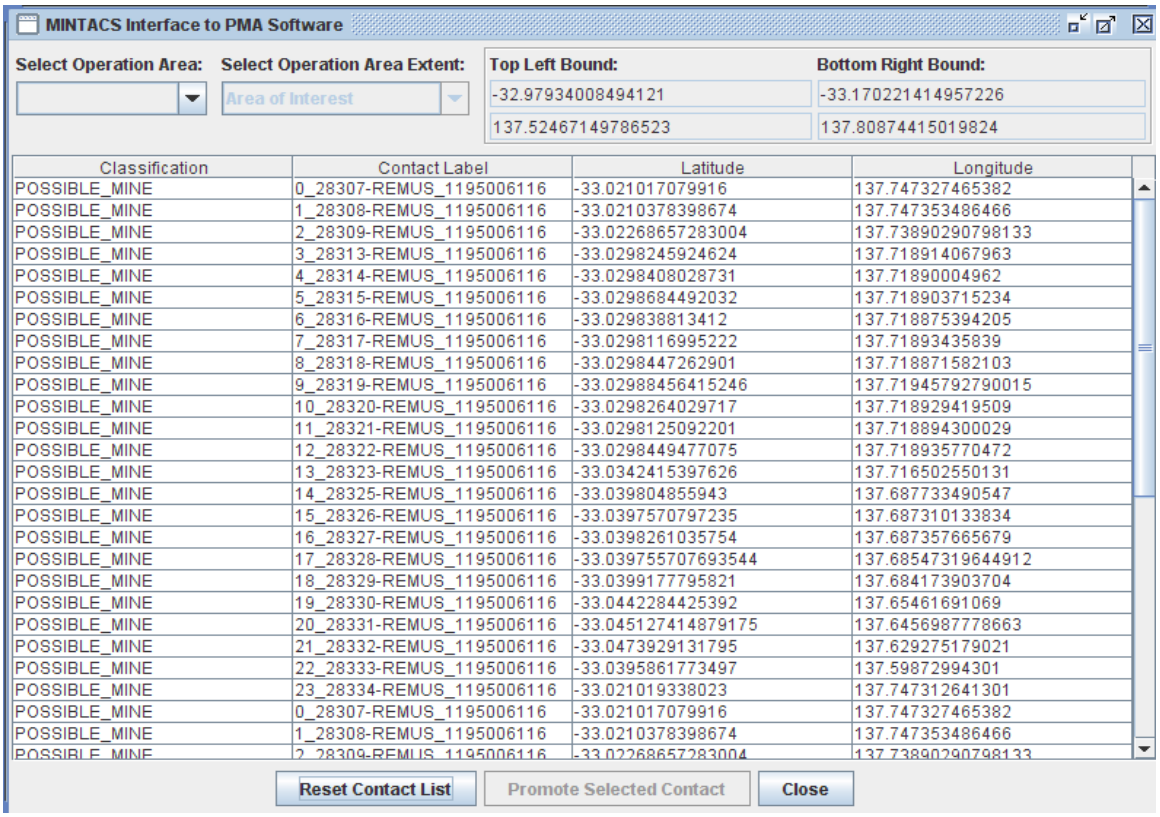


To filter the contacts within the MINTACS_interface:

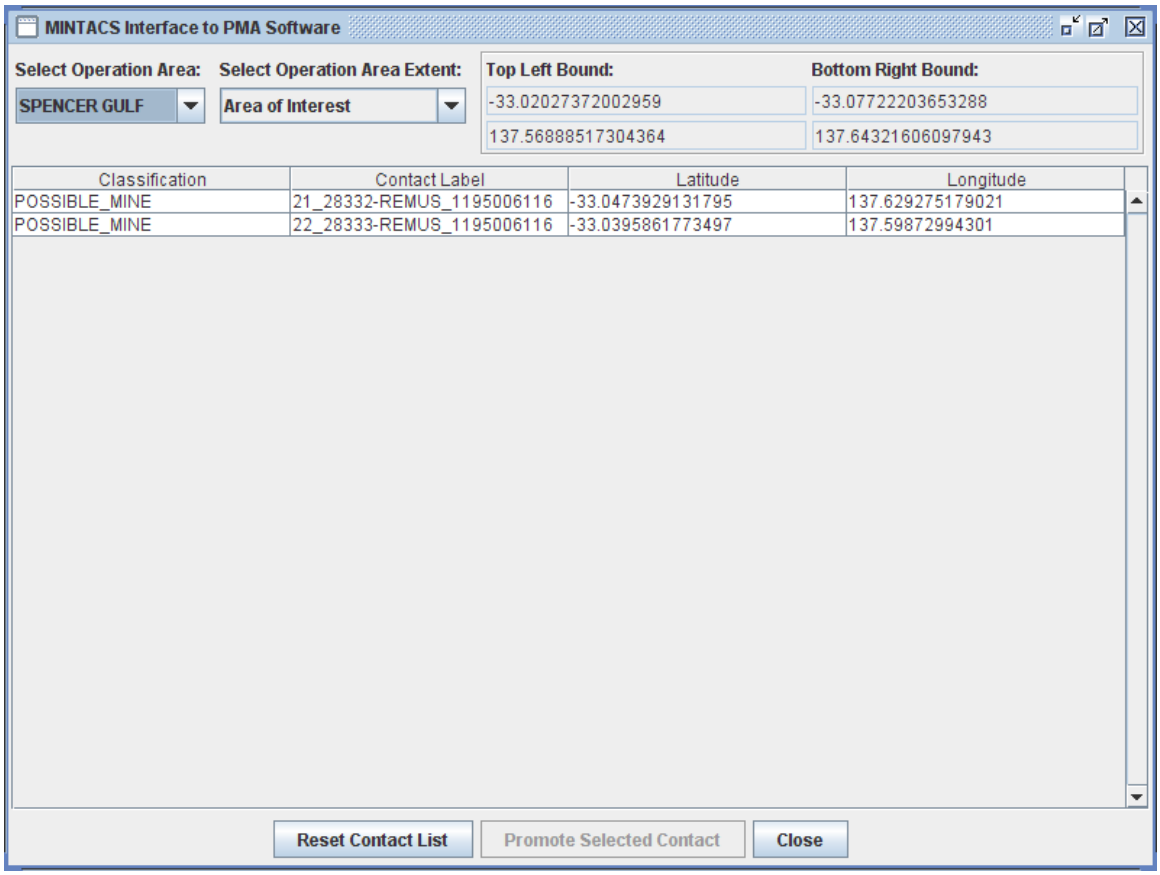
1. Re-draw the track for the Area of Interest or Operational Area within MINTACS.



2. **Reset Contact List** button will call the database and display the contacts based on the new settings created in MINTACS.



3. Select the Operation Area and Area Extent to filter the contacts based on the MINTACS settings.



Appendix A: XML Schema

```
<?xml version="1.0" encoding="UTF-8"?>

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
            targetNamespace="http://xml.netbeans.org/schema/MissionReport"
            xmlns:tns="http://xml.netbeans.org/schema/MissionReport"
            elementFormDefault="qualified">

        <xsd:element name="exportmission">
        <xsd:complexType>
            <xsd:sequence>
                <xsd:element                              name="missionName"
type="xsd:string"></xsd:element>
                <xsd:element                     name="missionDescription"
type="xsd:string"></xsd:element>
                <xsd:element          name="object"          minOccurs="0"
maxOccurs="unbounded">
                    <xsd:complexType>
                        <xsd:sequence>
                            <xsd:element                  name="contactID"
type="xsd:integer"></xsd:element>
                            <xsd:element                   name="latitude"
type="xsd:double"></xsd:element>
                            <xsd:element                  name="longitude"
type="xsd:double"></xsd:element>
                            <xsd:element                      name="width"
type="xsd:double"></xsd:element>
                            <xsd:element                     name="length"
type="xsd:double"></xsd:element>
                            <xsd:element                     name="height"
type="xsd:double"></xsd:element>
                            <xsd:element                   name="timeDate"
type="xsd:dateTime"></xsd:element>
                        </xsd:sequence>
                    </xsd:complexType>
                </xsd:element>
            </xsd:sequence>
            <xsd:attribute name="missionID" type="xsd:int"/>
        </xsd:complexType>
    </xsd:element>

</xsd:schema>
```

Appendix B: Developer Notes

B.1. Workaround for MINSTE and MS SQL Server 7 Connection

If MINSTE is required to connect to an instance of MINTACS using MS SQL Server 7 then changes to the source code are needed and a connection to the database established by creating an ODBC Bridge to a MS Access database where the tables from the MS SQL Server 7 databases have been imported into.

B.1.1 Source Code Changes

The following source code changes are required:

- Change `MINTacsRSDataHandler` to extend `MSAccessDataHandler`
- Change `MINTacsDataHandler` to extend `MSAcessDataHandler`
- Remove local `initConnection()` method in `MINTacsRSDataHandler` and `MINTacsDataHandler` and invoke the parent `initConnection()` method in `MSAccessDataHandler.`
- Add new constructors:

```
public MINTacsRSDataHandler(Properties properties) {
      super();
      dbq = properties.getProperty("MINTACS_RSDB.filePath");
      URL = URL1 + dbq + URL2;
}

public MINTacsDataHandler(Properties properties) {
      super();
      dbq = properties.getProperty("MINTACS_DB.filePath");
      URL = URL1 + dbq + URL2;

}
```

- Change all the table names in the SQL queries from `TABLENAME` to `dbo_TABLENAME`. This change needs to be implemented in:
    - `MINSTE.datahandler.mintacsDB.MINTacsDataHandler`
    - `MINSTE.function.mintacs_xml_xt.MINTacsRSD_XML_Import`
    - `MINSTE.function.mintacs_contact_promote.MINTacsDBContact_Export`

- Ensure the following property file configuration is implemented in the `MINTACS.properties` file:
    - `MINTACS_DB.filepath=`
    - `MINTACS_DB.configured=false`
    - `MINTACS_RSDB.filepath=`
    - `MINTACS_RSDB.configure=false`

- In `MINSTE.function.control.FunctionSelectionPanel` remove the following source code:

```
   public void actionPerformed(ActionEvent e) {

          …
          …
          else if
(e.getActionCommand().equalsIgnoreCase(configureMINTACSAction))
          {
            new ConfigureSQLServerSettings(this,properties);
          }

          …
          …
```

And implement the source code below:

```
   public void actionPerformed(ActionEvent e) {

          …
          …
          else if
(e.getActionCommand().equalsIgnoreCase(configureMINTACSAction))
          {
            new ConfigureMINTACSDatabasePanel(this,properties);
          }

          …
          …
```

B.1.2 Create ODBC Bridge to Connect MINSTE and MINTACS using MS SQL Server 7.

For MINSTE to connect to the MINTACS database MS SQL Server 7 an ODBC bridge needs to be established between MS Access database and MS SQL Server 7.

The user must establish two bridges one for MINTACS Tactical database, named MINTACS, and the other to the MINTACS Route Survey database, named MINTAC_MWDS. Once the bridge is established a new MS Access database must be created for the database MINTACS and MINTACS_MWDS. The MS Access database can then import the tables; any changes then made to the data in MS Access is automatically updated to the databases stored in MS SQL Server 7.

The instructions are as follows[11]:

Create an ODBC

1. Go to the system's **Control Panel**
2. Select **Administrative Tools**
3. Select **Data Sources (ODBC)**
4. Select tab **System DSN**
5. Select **Add**
6. Select **SQL Server** as the driver in which a data source is required
7. Select **Finish**

This will generate a wizard for creating a new data source to SQL Server.

Create a New Data Source to SQL Server (to MINTACS database)

8. Enter *MINTACS* in the Name text field
9. Enter *Bridge to MINTACS database* in the Description text field
10. Enter '.' in the Server text field
11. Select **Next**
12. SQL Server should verify the authenticity of the login ID; select '**With Windows NT authentication using the network login ID**'.
13. Select **Connect to SQL Server to obtain default settings for the additional configuration options**.
14. Select **Next**
15. Select **Change the default database to**:
16. Select **MINTACS**
17. Select **Use ANSI quoted identifiers**
18. Select use **ANSI nulls, paddings and warnings**
19. Select **Next**
20. Accept default setting for this panel.
21. Select **Finish**
22. A window with the SQL Server configuration will be displayed. Select **Test Data Source** to ensure configuration is correct. If test is completed successfully select **OK**. If test is not successful revisit configuration setup by selecting **Back**.

Follow step 5 through to step 7 to create a new data source to SQL Server.

Create a New Data Source to SQL Server (to MINTACS_MWDS database)

23. Enter *MINTACS RSDB* in the Name text field
24. Enter *Bridge to MINTACS RSDB* in the Description text field
25. Enter '.' in the Server text field
26. Select **Next**

[11] The instructions are based on the operator using a MS Windows XP Professional operating system and MS Access 2003. While it is not anticipated for the operator to have any difficulty implementing the given procedure if using other MS versions there is instruction on the internet to create ODBC bridges and MS Access functionality.

27. SQL Server should verify the authenticity of the login ID; select '**With Windows NT authentication using the network login ID**'.
28. Select **Connect to SQL Server to obtain default settings for the additional configuration options**.
29. Select **Next**
30. Select **Change the default database to**:
31. Select **MINTACS_MWDS**
32. Select **Use ANSI quoted identifiers**
33. Select use **ANSI nulls, paddings and warnings**
34. Select **Next**
35. Accept default setting for this panel.
36. Select **Finish**
37. A window with the SQL Server configuration will be displayed. Select **Test Data Source** to ensure configuration is correct. If test is completed successfully select **OK**. If test is not successful revisit configuration setup by selecting **Back**.

For the ODBC Data Source Administrator; create a new MS Access database for each database an ODBC bridge was created for.

38. Open **MS Access**
39. Select **File** and **New Blank Database**
40. Name the database and save to user defined directory. It is suggested that the databases should be named after the databases stored on MS SQL Server. That is, the new databases saved as *MINTACS.mdb* and *MINTAC_MWDS.mdb*.

Import MINTACS tables into MS Access database:

41. Select **File**
42. Select **Get External Data**
43. Select **Link Tables**
44. Scroll down Files of type and select **ODBC Databases ()**
45. Select **Machine Data Source**
46. Select **MINTACS**
47. Select **OK**
48. **Select ALL**. The tables will be named dbo.TABLENAME.
49. Select **OK**
50. A table's unique record identifier may be requested. Select the first column name in the list (would usually be identified with ID in the column name) OR ignore by selecting OK.
51. The tables in MS Access need to be labelled dbo_TABLENAME, for example, dbo_WAYPTLEG or dbo_CONTACT. This should be done automatically as part of this procedure.

Import MINTACS_MWDS tables into MS Access database:

52. Select **File**
53. Select **Get External Data**
54. Select **Link Tables**

55. Scroll down Files of type and select **ODBC Databases ()**
56. Select **Machine Data Source**
57. Select **MINTACS RSDB**
58. Select **OK**
59. **Select ALL**. The tables will be named dbo.TABLENAME.
60. Select **OK**
61. A table's unique record identifier may be requested. Select the first column name in the list (would usually be identified with ID in the column name) OR ignore by selecting OK.
62. The tables in MS Access need to be labelled dbo_TABLENAME, for example, dbo_CONTACT. This should be done automatically as part of this procedure.

If any of the MS Access databases created are deleted the ODBC bridge does not need to be re-established.

When configuring the MINTACS databases within MINSTE select the two MS Access databases created during this process.

B.2. MINSTE Source Packages

The source packages for the MINSTE application are organised as follows:

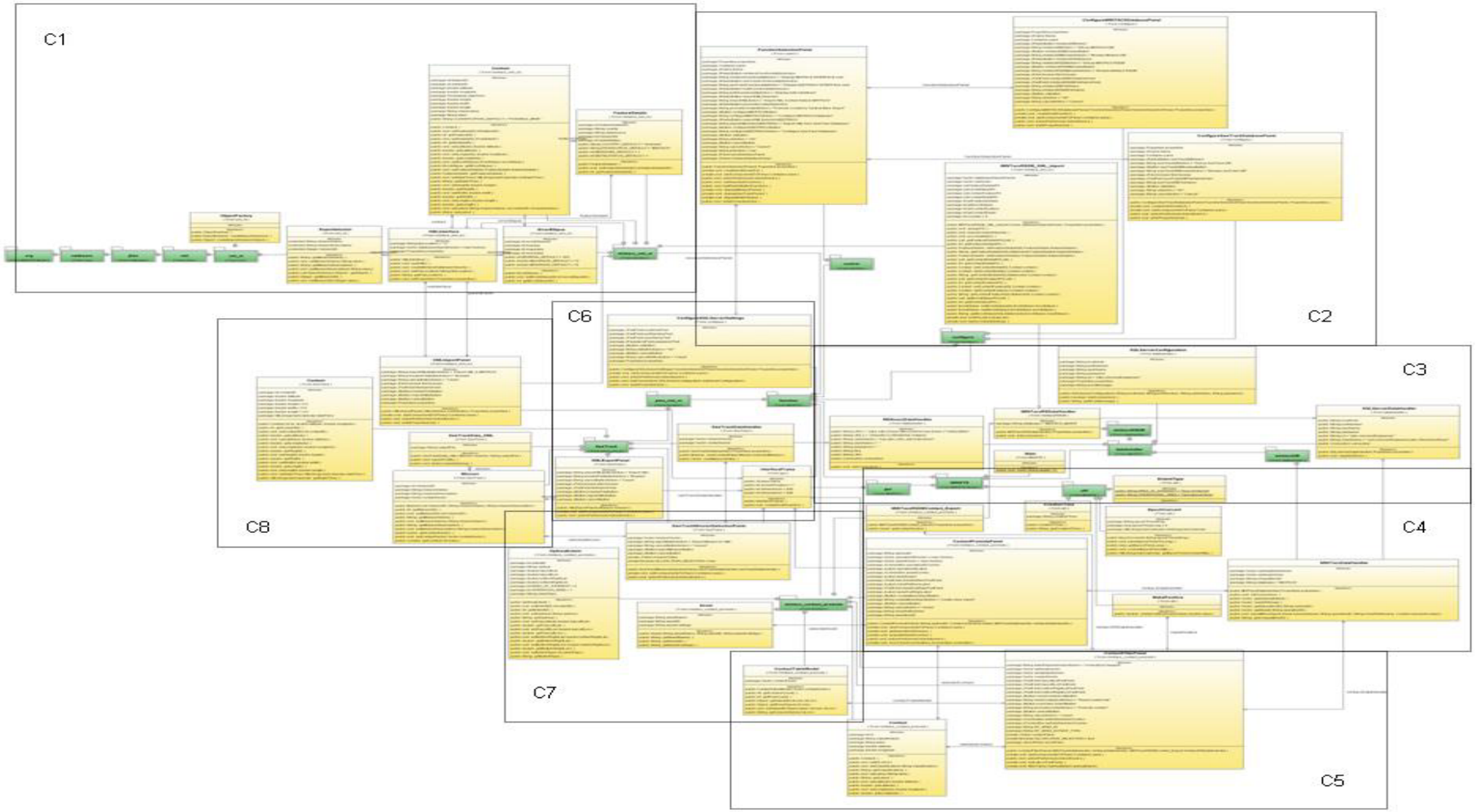
- `MINSTE.datahandler`:- all the code to handle the database connections and configuration is available from this package.
    - `MINSTE.datahandler.mintacsDB`:- data handler functionality specific to the MINTACS database.
    - `MINSTE.datahandler.mintacsRSDB`:- data handler functionality specific to the MINTACS_MWDS (RSDB) database.

- `MINSTE.function`:- all the code to provide functionality for the MINSTE application.

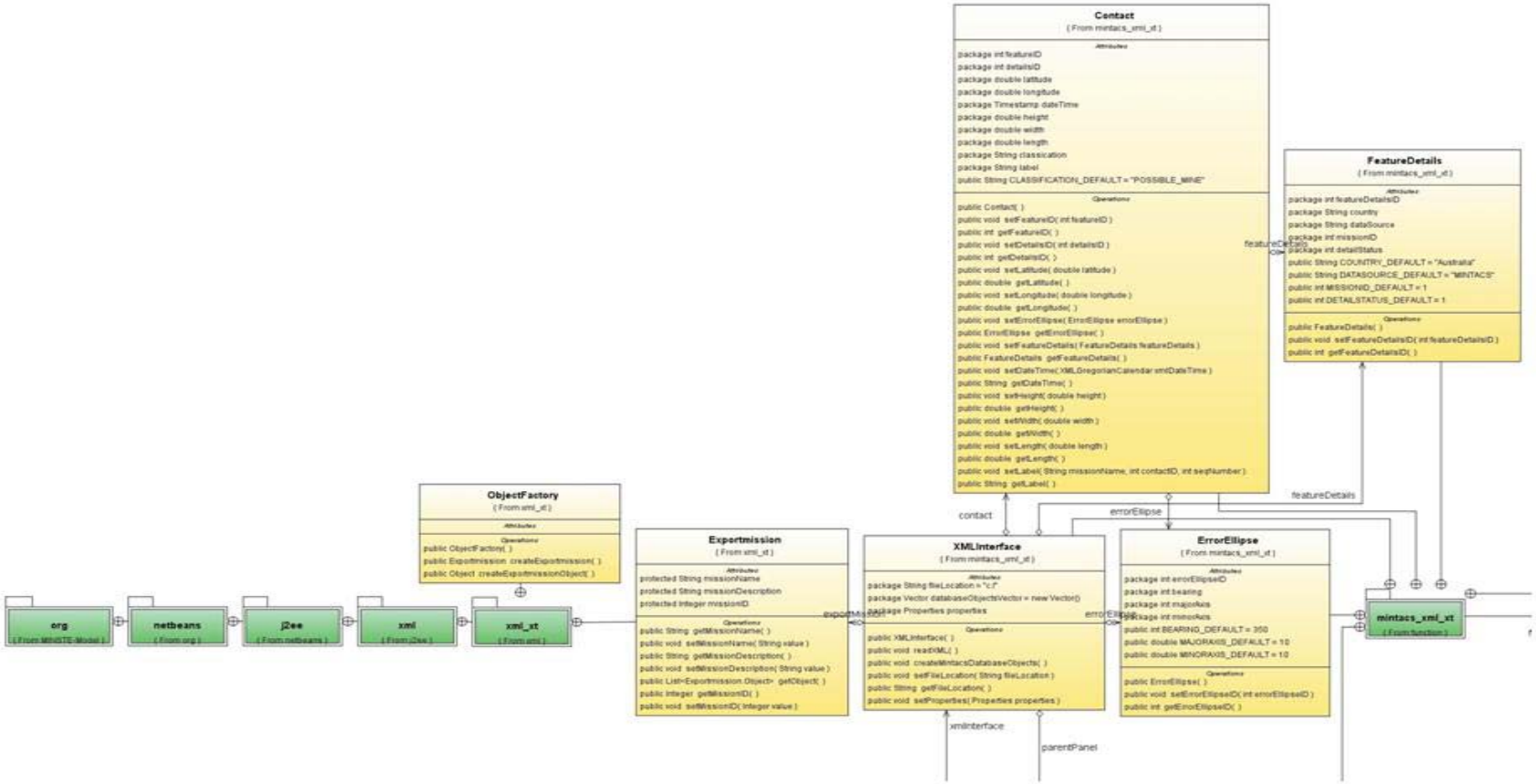
    - `MINSTE.function.configure`:- GUI panel to configure the database setting for connection to the MINTACS databases and SeeTrack database.
    - `MINSTE.function.control`:- main panel providing access to all the functionality for MINSTE.
    - `MINSTE.function.mintacs_contact_promote`:- provides the GUI panels, functionality and objects required to promote a contact from the database MINTACS_MWDS to the MINTACS database as a tactical mine object.
    - `MINSTE.function.mintacs_xml_xt`:- provides the GUI panels, functionality and objects required to import an XML document into the MINTACS_MWDS database.
    - `MINSTE.function.pma_xml_xt.SeeTrack`:- provides the GUI panels, data handler, functionality and objects required to export a mission and its contact data from the SeeTrack database to an XML document.

- `MINSTE.gui`:- all the code for the parent class used for the GUI.
- `MINSTE.util`:- contains the utility code.

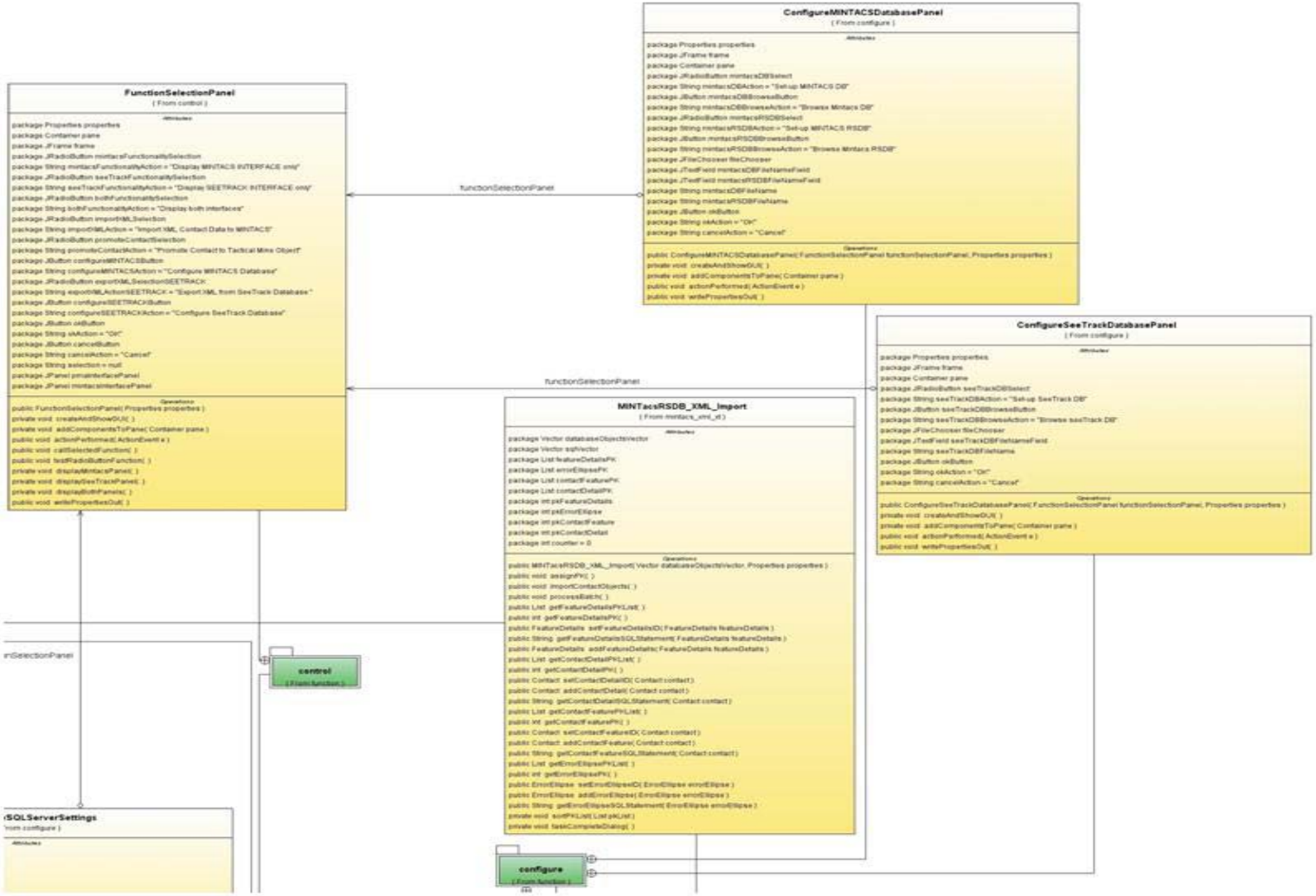
Appendix C: MINSTE Class Diagram



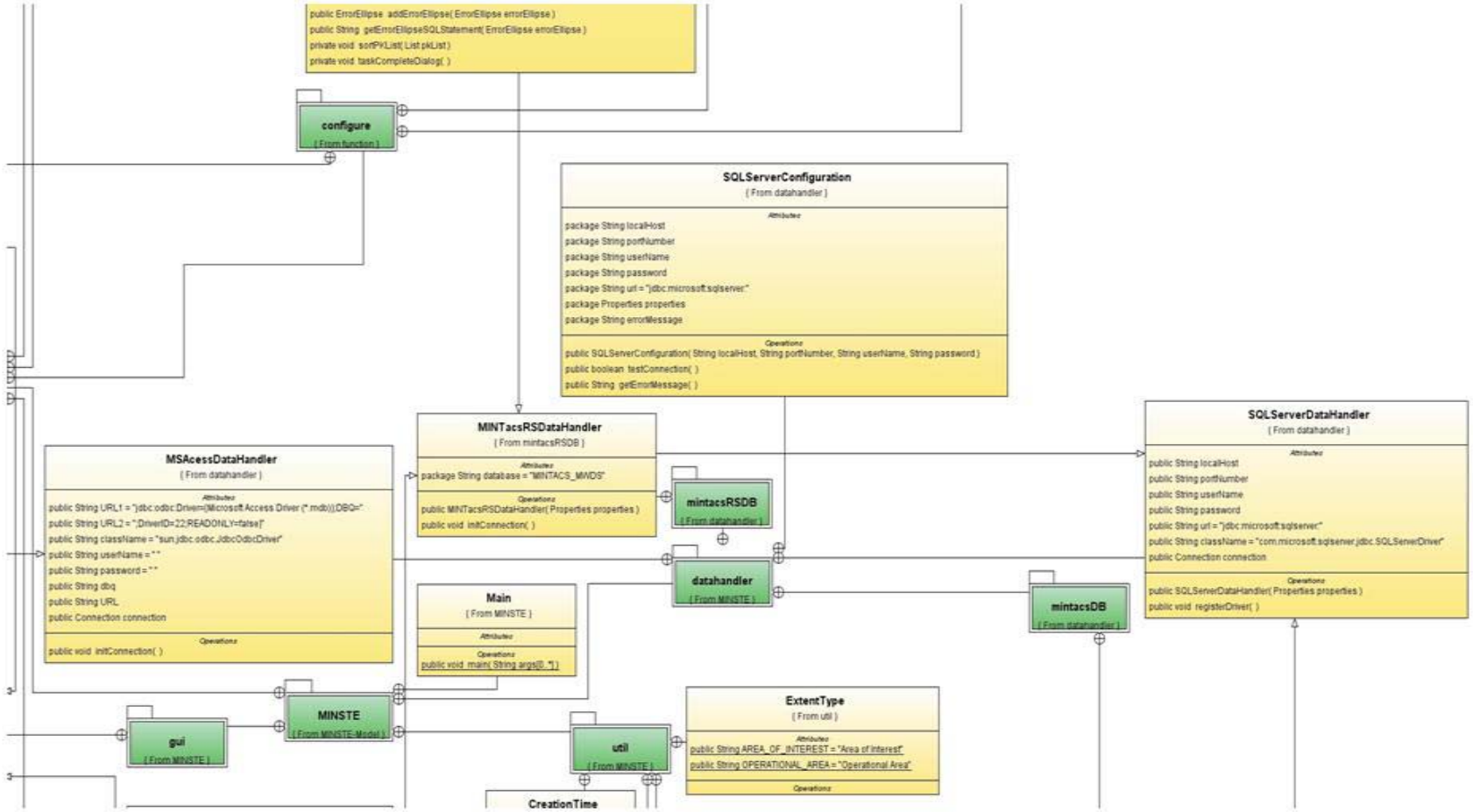
C.1. MINSTE Class Diagram: Section C1



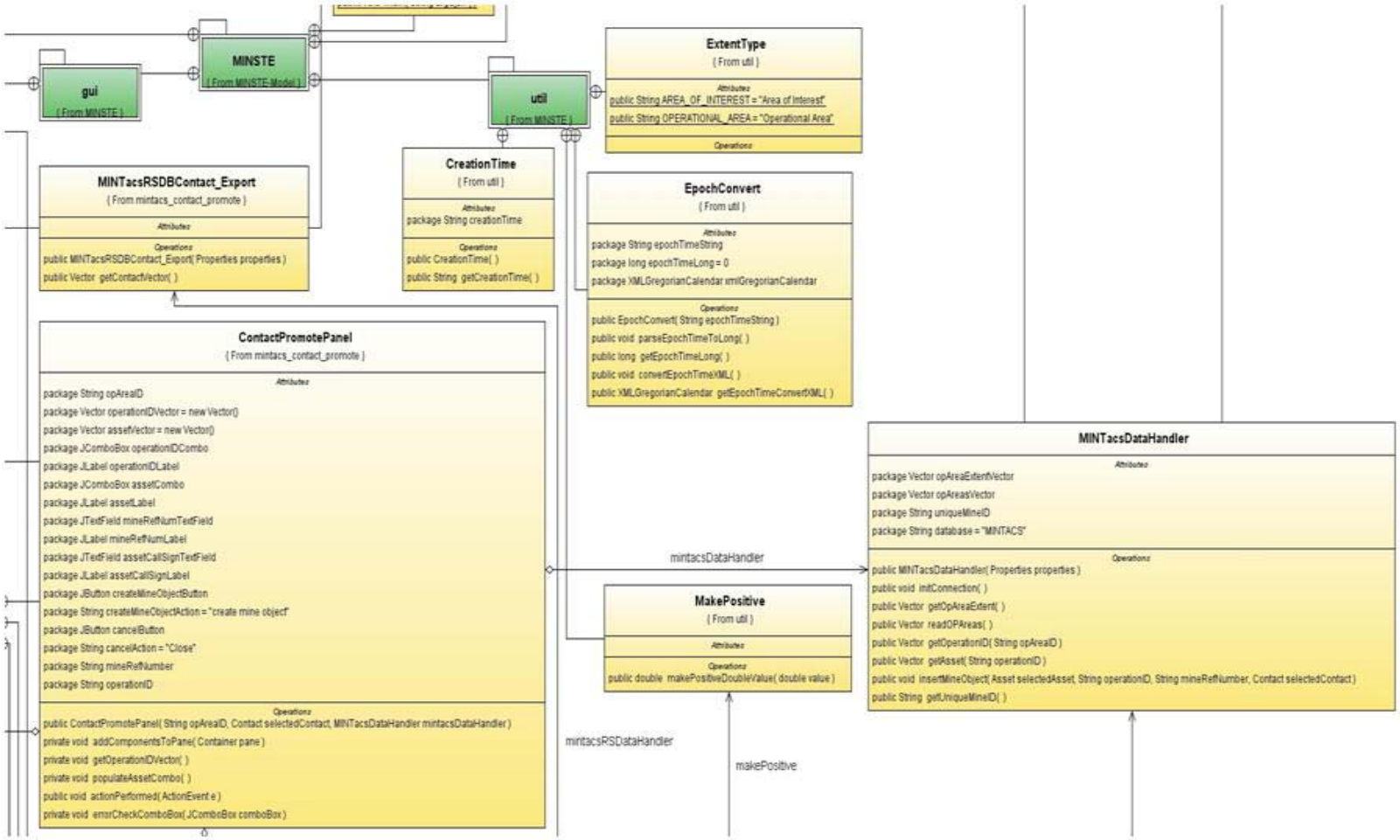
C.2. MINSTE Class Diagram: Section C2



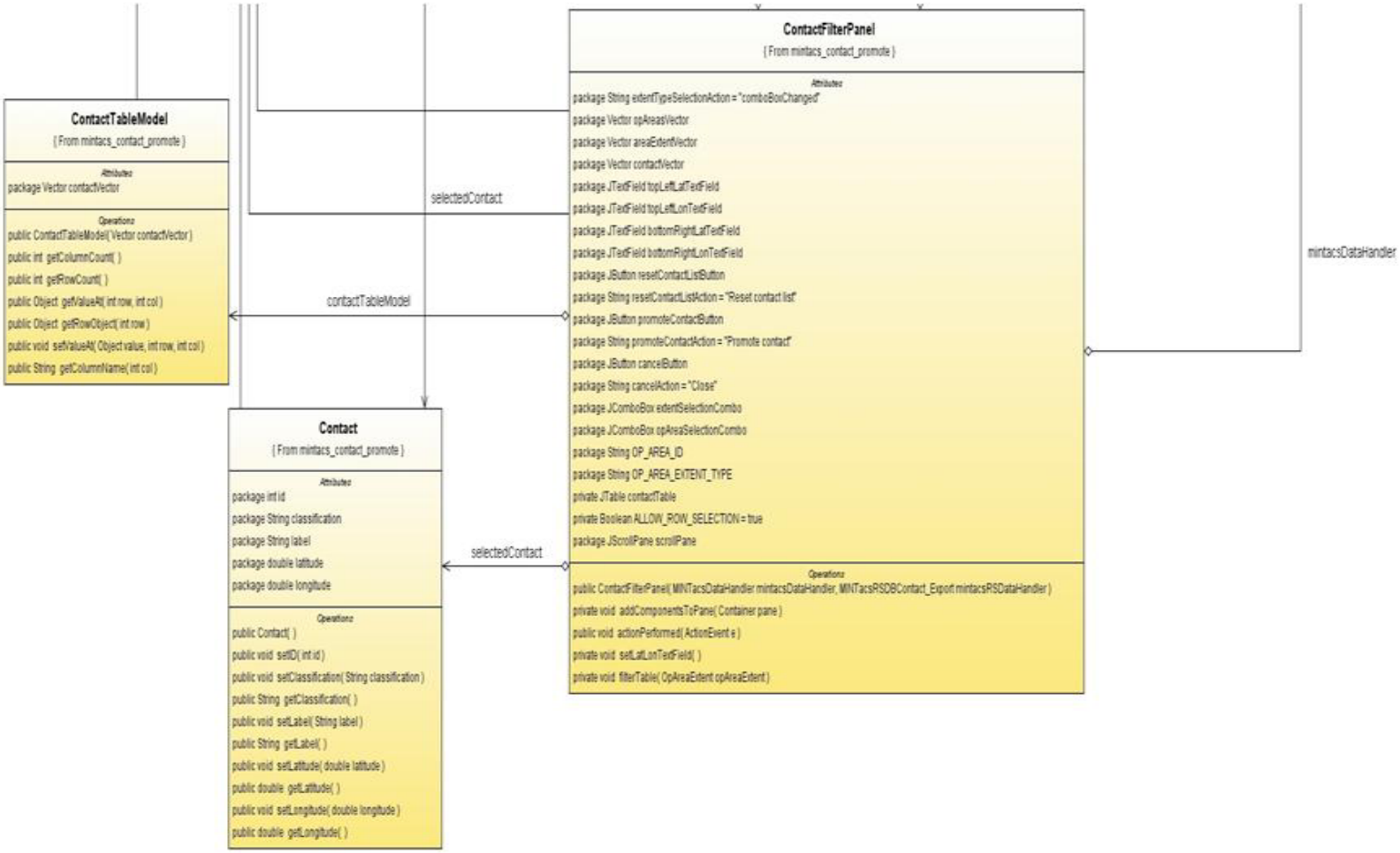
C.3. MINSTE Class Diagram: Section C3



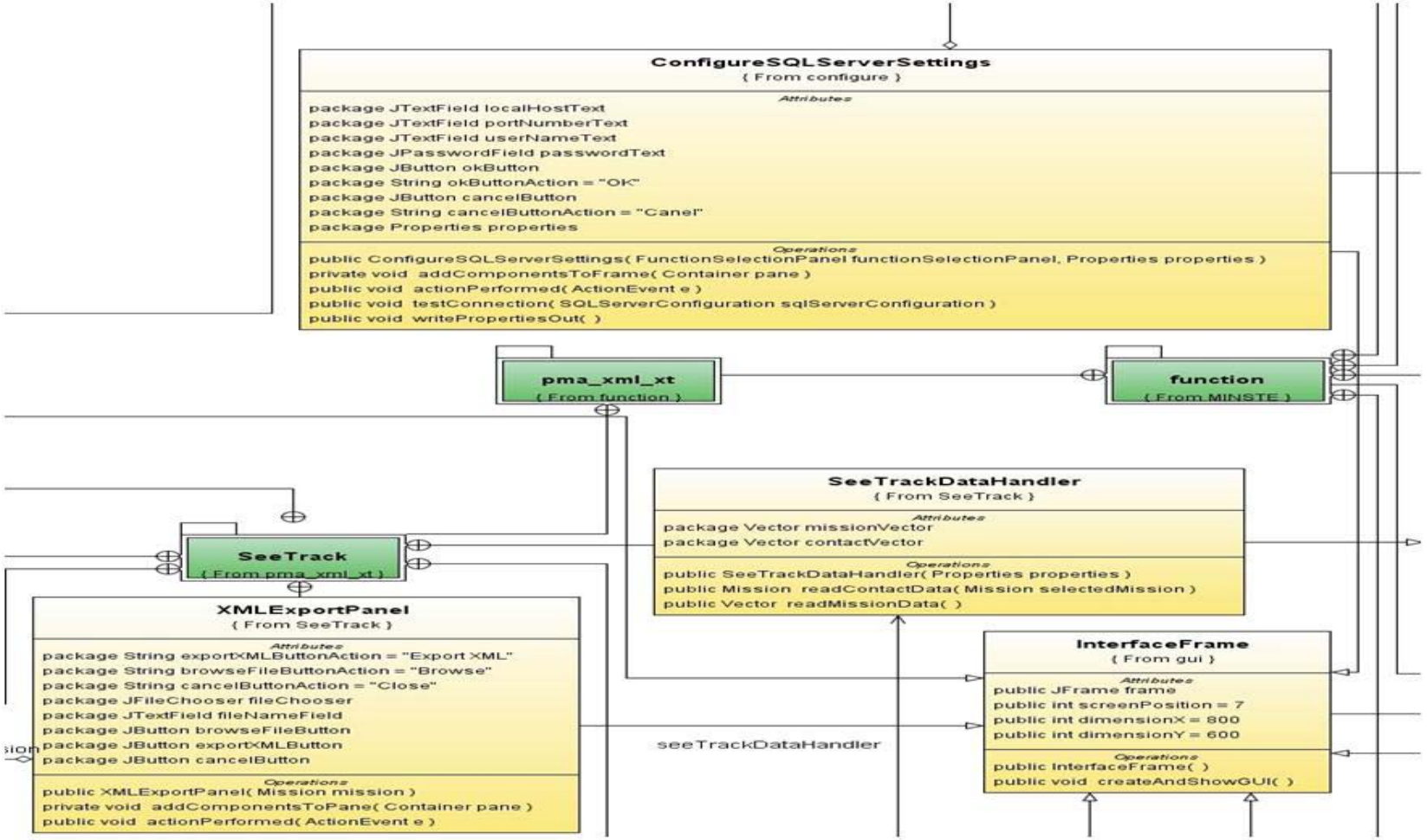
C.4. MINSTE Class Diagram: Section C4



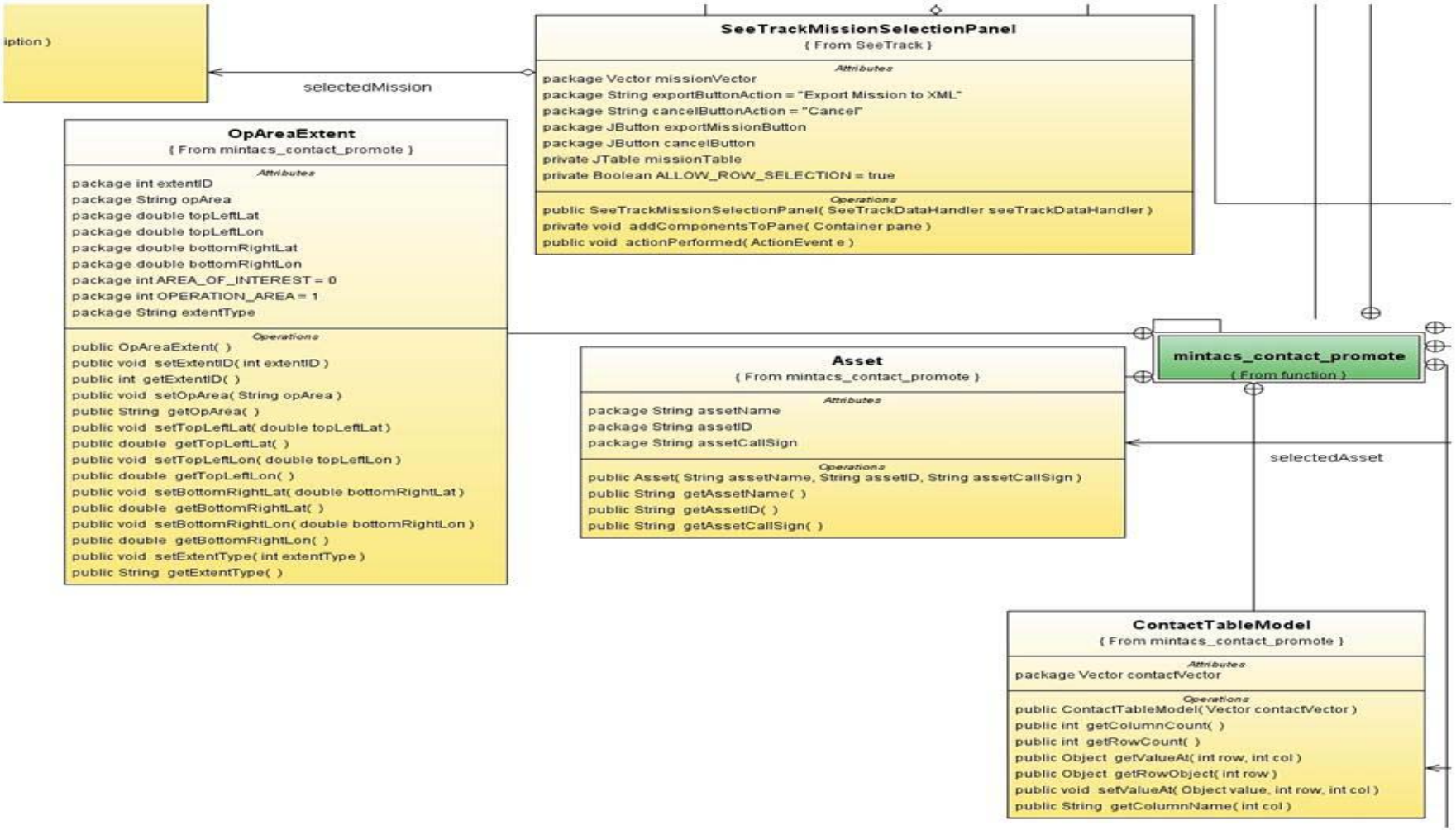
C.5. MINSTE Class Diagram: Section C5



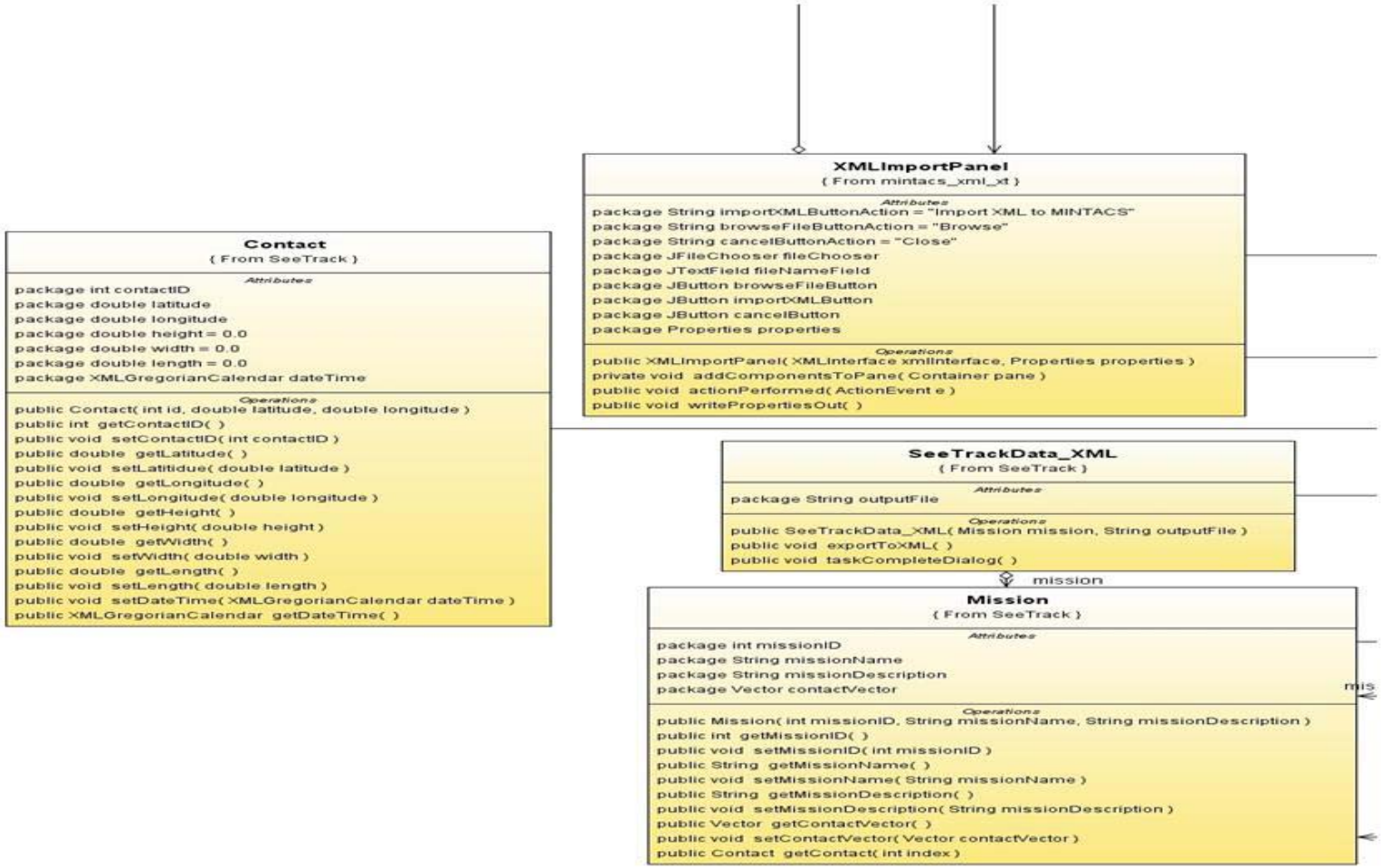
C.6. MINSTE Class Diagram: Section C6



C.7. MINSTE Class Diagram: Section C7



C.8. MINSTE Class Diagram: Section C8



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UUV
SeeTrack
MINTACS
XML
Automatic data exchange

19. ABSTRACT

The computer program MINTACS SeeTrack Exchange (MINSTE) interface was developed to support the automated data transfer to the RAN Mine Warfare Tactical Decision Aid MINTACS from SeeTrack, a post-mission analysis tool for data collected by towed or self-propelled (unmanned) side-scan sonar systems in support of military operations such as reconnaissance of sea routes for detection of mine-like objects. This document is a detailed technical user manual for the MINSTE software program. For a general overview of MINSTE design principles and objectives, the reader is referred to DSTO-GD-0574, "Design and Evaluation of the MINTACS SeeTrack Exchange (MINSTE) Concept Demonstrator".